APRIL 10, 1961

# PAPER TRADE JOURNAL

**Preliminary Details Revealed of On-Machine Cast Coating in Color**

**One Big Feature of New Bowater U.K. Mill is Magazine Grinders**

**Let's Look at Materials Handling Of Transporting, Storing Chips**

**Both Wet End, Size Press Starch Cooking Automatic at Monadnock**

Contents of the Week, pages 4-5

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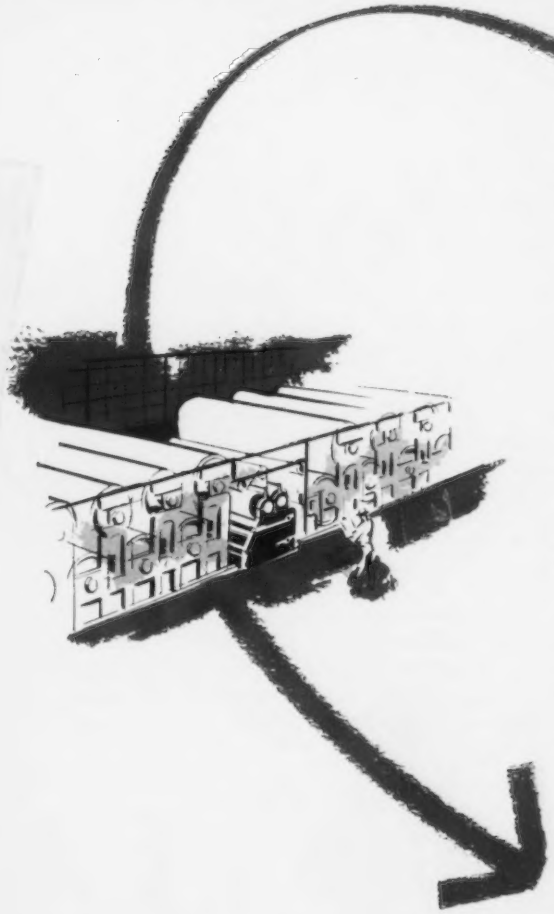

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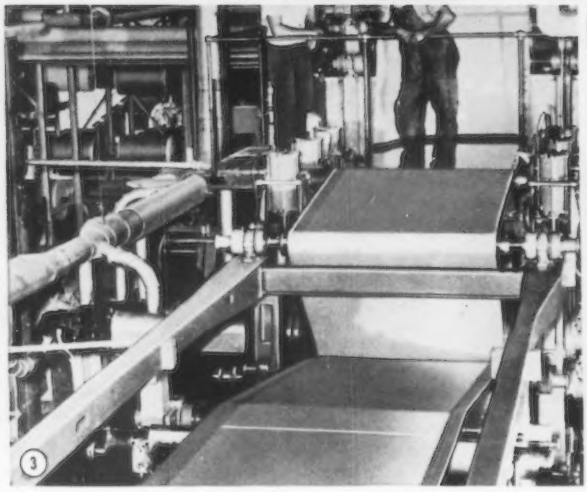

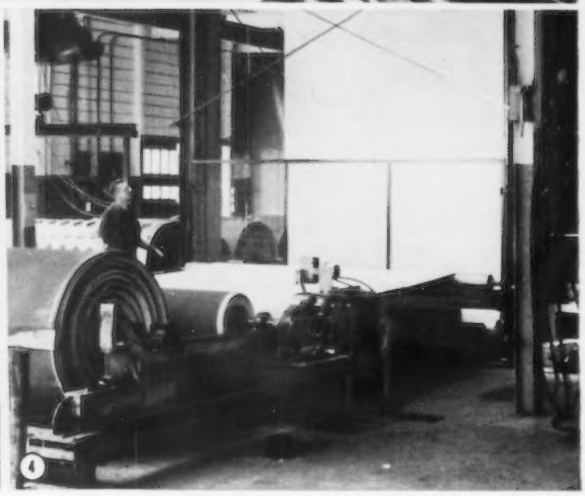

# They're getting profit ideas on paper with Goodyear latices

***Big news-makers*** in the paper industry are the special products being developed to do special jobs. Like making a stronger, more oil-resistant gasket. (1) Or toughening up tape. (2) Or making dielectric sheets more solvent-resistant. (3) Or printing full-color flooring patterns 100 times sharper. (4) And to do these jobs, paper manufacturers are turning to Goodyear latices.

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***To simplify*** selecting them, Goodyear offers four basic types: PLIOLITE *Latex* in two forms (as a rubber or resin dispersion), PLIOVIC *Latex* (dispersion of vinyl copolymer resin), and CHEMIGUM *Latex* (dispersion of nitrile rubber). Each can be used alone—in combination with another—or as a modifier in your present materials. For the finest in technical help on latices, including the latest *Tech Book Bulletins*, write Goodyear, Chemical Division, Dept. D-9427, Akron 16, Ohio.

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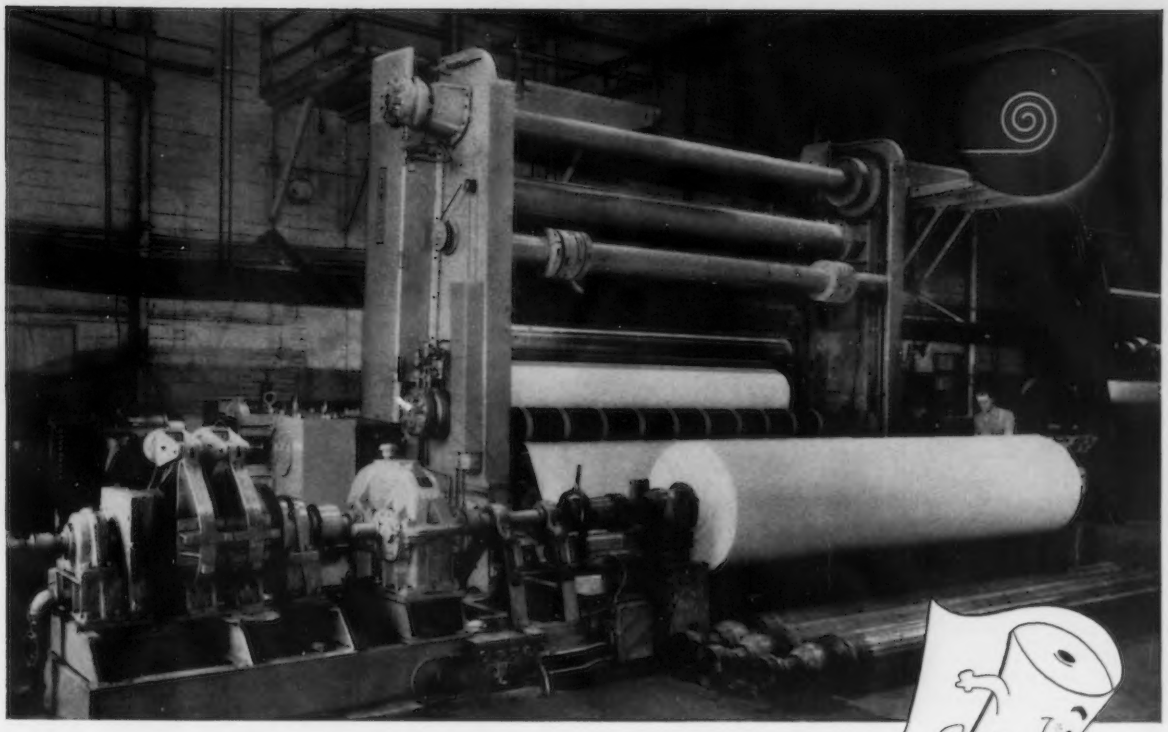

## **Cameron 470** *delivers the superb running qualities of* **The New Roll**

**SULPHITE BOND** ranging from 18 to 40 lb. basis weight is slit and wound into rolls of superb *running* quality on this 158" Cameron 470 integrated roll production system. Some of the features which contribute to roll quality control are:

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...riding roll belt driven at both ends, with automatic cam-controlled counterweighting, for optimum pressure and torque distribution. Raised and lowered by hydraulic lift. Incorporates down-pressure brakes for tight starts and firmly set cores.

...external main drive gear box and flexible couplings isolate vibration and deflection which might otherwise cause imperfections in rewinding rolls.

...Cameron Quick-Set shear cut slitters, dynamically balanced and tested rotating elements, and the Cameron system of rewind drum grooving which assists in removing web wrinkles and contributes to positive roll separation. Optional 470 features include the hydraulic roll ejector, and roll lowering table; automatic shaft puller, and core loader; and the Cameron automatic roll density control system.

**All control elements** on the Cameron 470 are adjustable and adaptable to the characteristics of the paper or board to be handled, the quality of the parent rolls, and the intended service of the finished rolls. The result is a custom-made finished roll, built to assure maximum yield through long, trouble-free runs in high speed printing and converting operations. The paper is kept fresh and *alive* for better end results, not stretched out *dead* in the roll.

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To achieve this *running* quality you are invited to consult with Cameron specialists on any question regarding unwinds, slitters, winders, tension controls, brakes and accessory roll production equipment. Write today for complete information.

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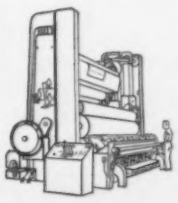
AA-393



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Week of April 10, 1961
Vol. 145, No. 15


## FEATURED THIS WEEK


**Bowaters Has New Ultra-Modern Groundwood Mill in England**
*Contains many interesting engineering features in wood unloading and storage, grinder feeding, reject refining, etc.—R. Reed* **36**

**Chip Handling and Storage—An Overall View**
*Here, two experts discuss the important factors, the problems, the advantages, the disadvantages of various systems used in transporting and storing the paper industry's basic raw material—F. G. Wilson and Curtis E. Green* **39**

**Monadnock Leads Way In Automatic Starch Cooking**
*Using jet cooking systems for both wet end and size press—R. J. Meador and M. L. Cushing* **46**

**Characteristics and Uses of Various High Yield Pulps**
*What are the advantages and disadvantages of the various high yield pulping processes? For which end product uses is each type most suited?—The author provides the answers in clear, concise manner—L. E. Eberhardt* **49**

**Now . . . On-Machine Cast Coating In Color!**
*With IFB's Glosscoat process, not only are pastel colors and heavy weight high-gloss boards possible, but cast coating is done on the cylinder machine* **53**



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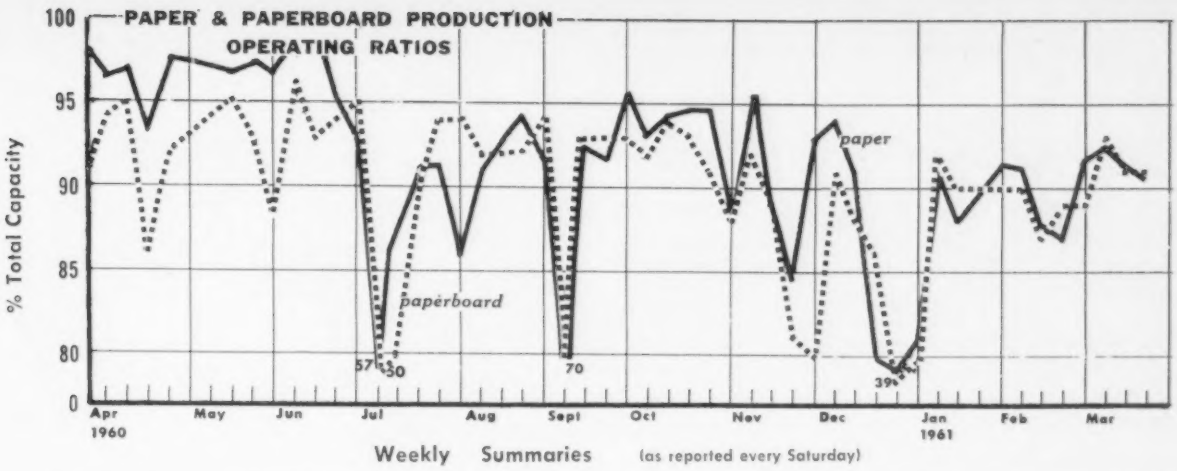


## NEWS OF THE WEEK

Strathmore Rebuilding Machine in Woronoco . . . Tennessee River Starts-Up New Container Board Mill . . . Simpson-Lee Schedules July Operations at Ripon . . . Kimberly-Stevens Buying Plant in Connecticut . . . . . News of the Industry 29

Great Northern Elects V-P . . . IP Announces Industrial Relations Appointments . . . CWP&P and Wisconsin River Name Power Supt. . . . Wilkinson Advances to New Post at Scott Paper . . . Swanson Retires from K-C Vice Presidency Paper People 32

Obituaries 33

Nicolet Perfects New Aluminized Glassine . . . Agler to Retire from St. Regis Container Division . . . Abercrombie Heads Kent Paper Co. . . . Alton Box Board Offers "Elite Flute" Board . . . Folding Paper Box Ass'n Elects Officers . . . News of Converters 34

New Literature 58

News of Suppliers 64

Figures of the Week 66

New Equipment & Supplies 68

Prices of Fibers 71

Classified Advertising 74

Advertisers Index 78

### REMEMBER THESE DATES

Technical Ass'n of the Pulp and Paper Industry, 12th Annual Coating Conference, Statler-Hilton, Buffalo, N. Y. — MAY 8-10

Paper Industry Management Ass'n National Meeting, Robert Meyer Hotel, Jacksonville, Fla. — JUNE 7-9

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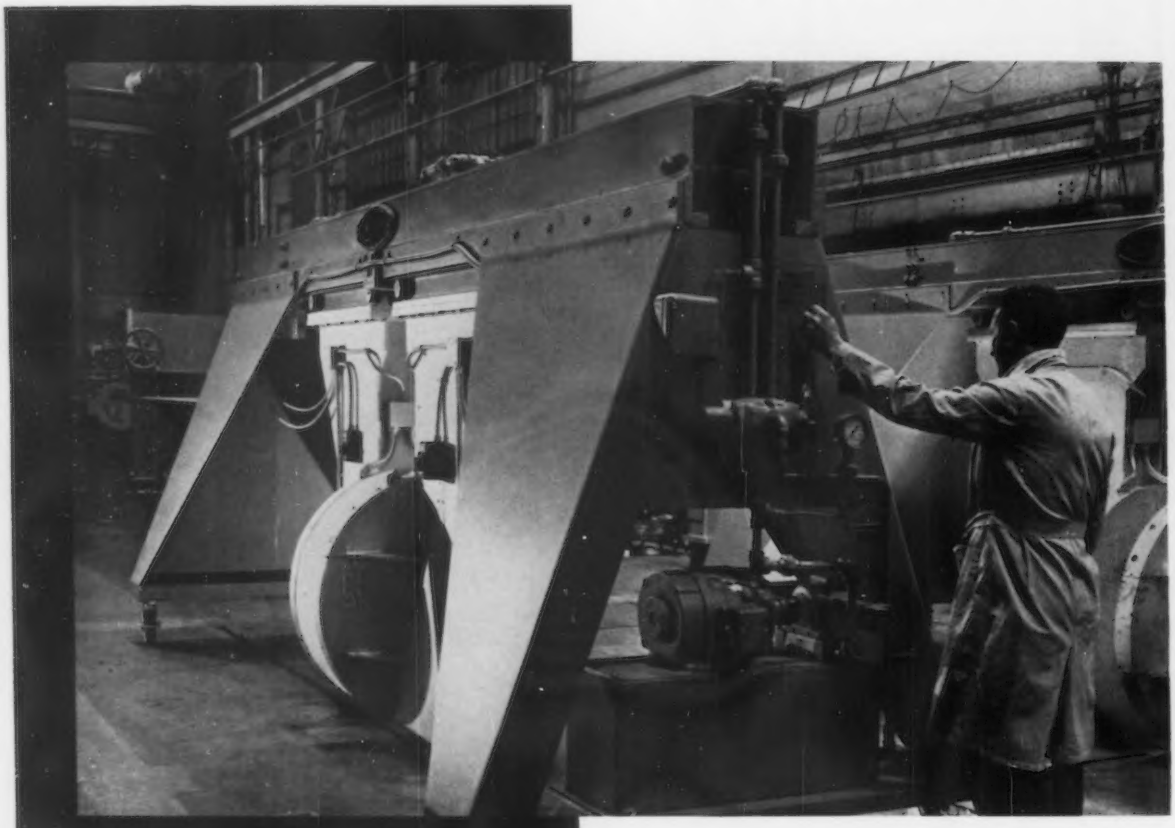

Newly designed Valley Portable Roll Header with electrically heated heads. This mobile unit can "head" rolls at any number of locations, thus saving costly roll handling and moving operations. This is another example of a specially designed and engineered piece of equipment to meet the requirements of a customer and to aid in reducing costs.

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# *Suppose you had to write on birch bark*

Birch bark was the best material Indians could find on which to paint their picture-messages. But when modern-day paper manufacturers included bark, birch or otherwise, in making groundwood pulp for paper, printing quality was poor.

The groundwood method produces twice as much pulp per cord of wood as other processes, but its low color was a drawback limiting its field of usefulness. In the 1940's Becco worked out a Hydrogen Peroxide bleach producing a superior brightness with improved softness and bulk as well. As a result, a good many manufacturers continue to use Becco to make groundwood paper a more desirable product.

Do you have an interest in groundwood or chemical pulps? Becco, with more years of bleaching experience than any other peroxide manufacturer, can help you. Address: Dept. PTJ-61-2.

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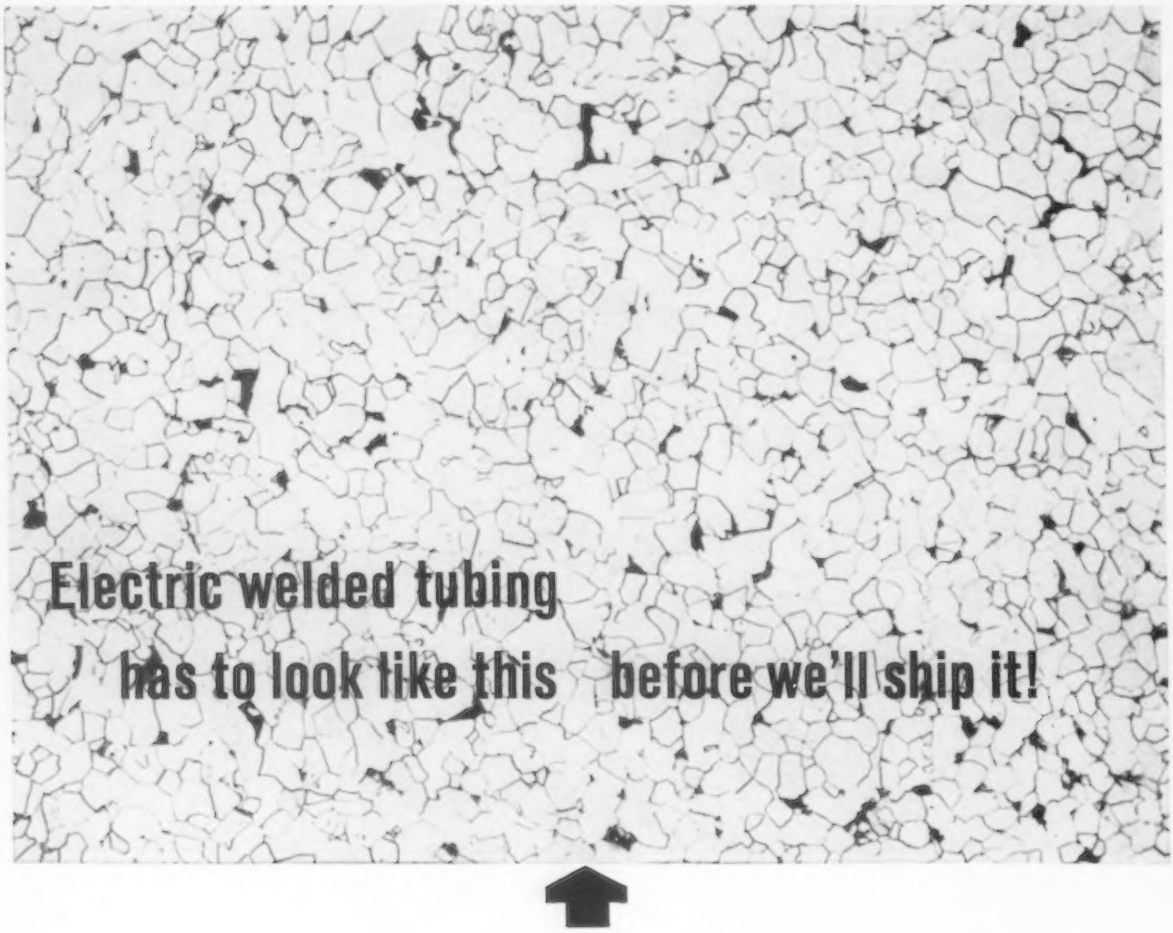


In this photomicrograph of a section of USS National Electric Resistance Welded Steel Pressure Tube the weld section runs right down through the center of the picture above the arrow. The consistency of structure between the weld area and the rest of the tube shows that USS National Welded Pressure Tubes have an important attribute—dependability.

Pressure tubes must be dependable. In the fabrication of heat transfer equipment—boilers, heat exchangers, condensers, superheaters and economizers, it is imperative that each tube be dependable, the entire installation is only as reliable as the weakest tube.

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National Tube Distributors all over the nation maintain stocks of USS National Electric Welded Pressure Tubes in sizes from ½″ O.D. x .035″ wall to 5½″ O.D. x .250″ wall and in lengths to 44 feet. Our Engineering Service Force is available to you for field consultation. For further information, write or phone National Tube Division, United States Steel, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

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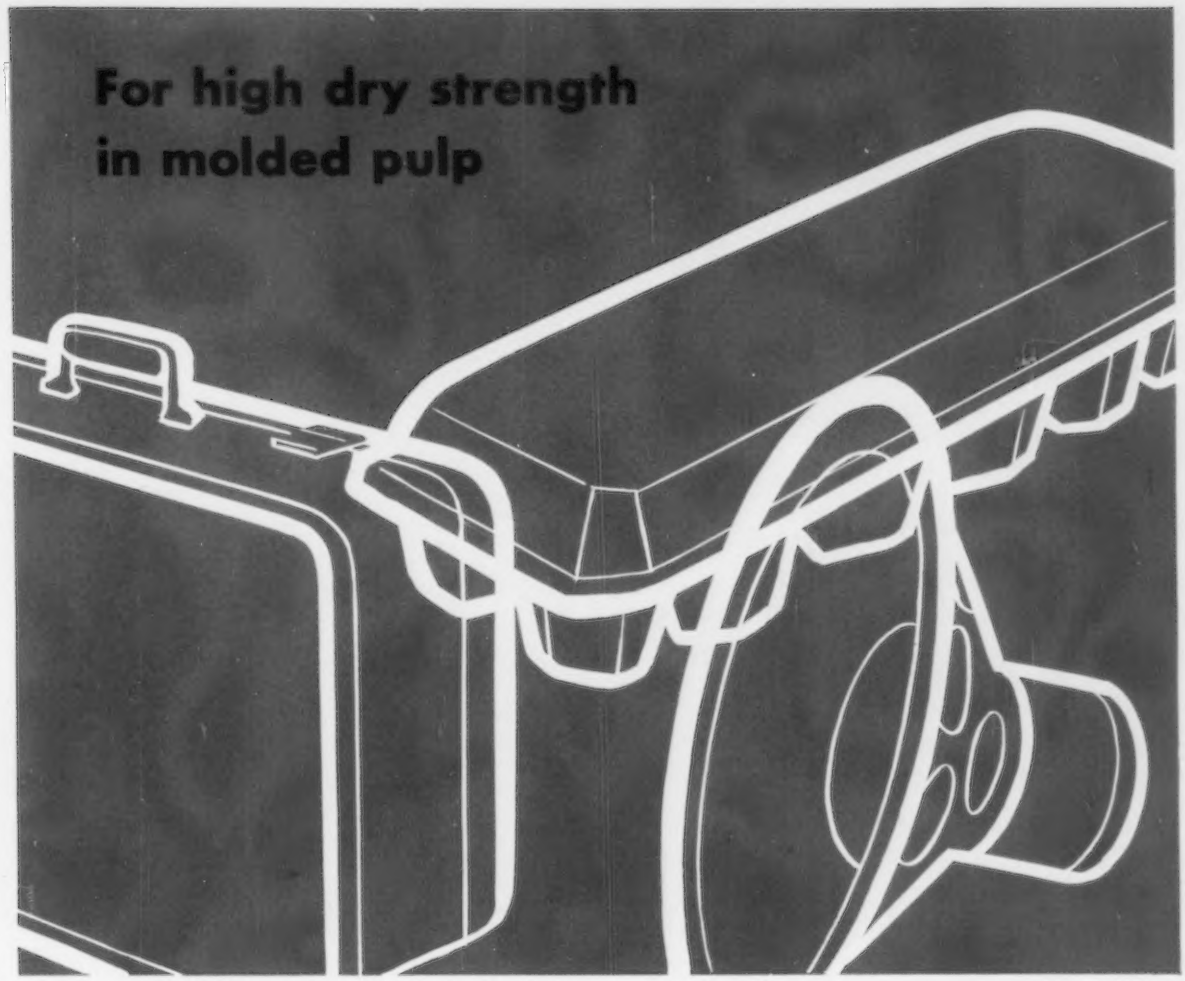


## Shawinigan GELVA® polyvinyl acetate emulsions

When toughness and rigidity are properties necessary in your molded pulp products investigate GELVA emulsions as web end additives. Substantantially increased strength and stiffness can be obtained with relatively small quantities of emulsion. The chart, right, presents data based on laboratory tests performed with three GELVA emulsions representative of Shawinigan's diversified line.

Shawinigan's products for paper applications include both GELVA polyvinyl acetate emulsions and resins and GELVATOL polyvinyl alcohol resins. A wide variety of standard grades is always available. Shawinigan's research staff and laboratories are ready to assist you with formulations for special applications. Write to Shawinigan Resins Corporation, Dept. 7S, Springfield 1, Massachusetts.

| | % Resin add-on (dry) | Flexural Strength lbs/in² | Relative Rigidity | Gain in weight 24 hrs water immersion at 25°C. |
|---|---|---|---|---|
| Control — no resin additive | 0 | 3000 | 1.00 | 240% |
| Gelva Emulsion S-51 | 10 | 6330 | 1.97 | 115% |
| Gelva Emulsion C-3 | 10 | 5520 | 1.91 | 140% |
| Gelva Emulsion S-55 | 10 | 4480 | 1.43 | 136% |

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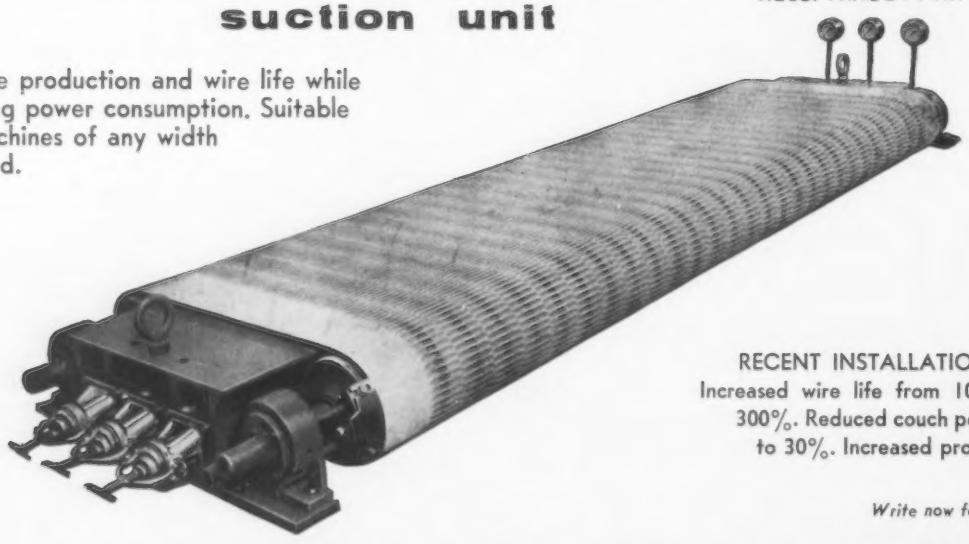

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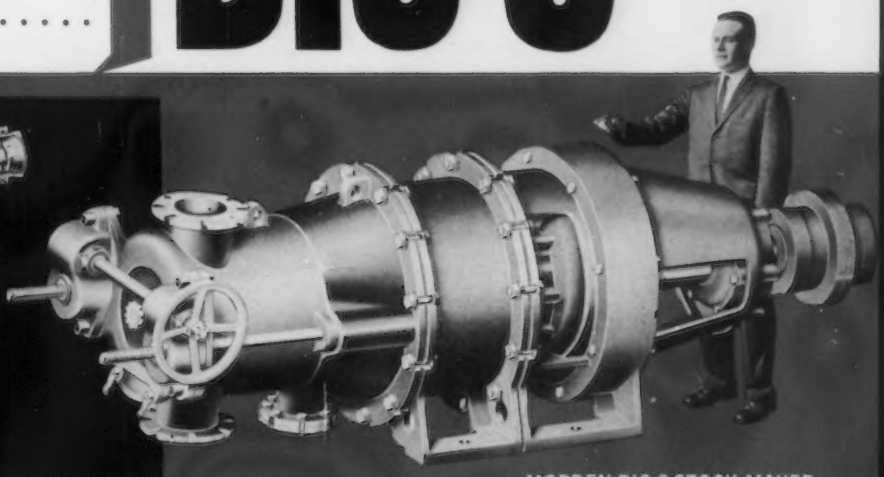
# BIG 8 REFINER

FIGURE 5. Big 8 Stock-Maker Refiner, illustrating reverse flow, cushioning principle. Stock enters hollow rotor at A, is forced between bars on rotor B and shell C where the opposing internal flow pressures hold a full cushion of stock, permitting heavy bar loading for maximum brushing, combing and fraying of the fibers. Cutting action is at a minimum.



MORDEN BIG 8 STOCK-MAKER
300-400 CONNECTED H. P.

FIGURE 1. Untreated pulp. Freeness, 635 Canadian Standard. Tear factor, 85.

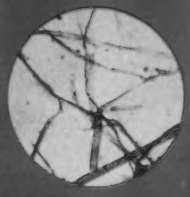


FIGURE 2. Medium treatment by Morden Stock-Maker. Freeness, 300 Canadian Standard. Tear factor, 85.

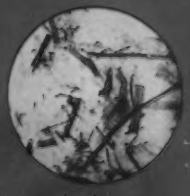


FIGURE 3. Medium jordaning treatment. Freeness, 275 Canadian Standard. Tear factor, 55.

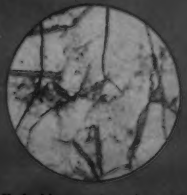


FIGURE 4. Heavy treatment by the Stock-Maker. Freeness, 75 Canadian Standard. Tear factor, 60.

The perfect refiner is yet to be built. But, the development which comes closest to refining perfection, customers tell us, is the MORDEN BIG 8 REFINER. Here is the BIG MORDEN 300-400 H. P. engine which provides the maximum in stock treatment. . . . Good Mullen • Improved tear retention • Excellent fold and tensile development • Printability specs met with ease through precision stock treatment.

**THE SECRET IS MORDEN'S DEVELOPMENT OF THE FIBERS.** The incompatibles, Good Mullen and Good Tear Retention at Minimum Freeness Reduction, are made compatible in the MORDEN BIG 8 REFINER through its brushing, combing action, which develops and frays the fibers with minimum cutting. The photomicrographs tell the story. FIGURE 1 shows unbleached sulphite prior to refining. FIGURE 2, the same fibers after medium treatment in the Morden Stock-Maker Refiner. Note the fraying and brushing imparted to each fiber. FIGURE 3, the same fibers treated to about the same level of freeness with a jordan. Notice how the fibers are cut, not frayed. FIGURE 4, the same fibers as Figure 2, except that the MORDEN refining treatment has been carried to much lower freeness. Even so, the tear in Figure 4, with twice as much MORDEN treatment, is better than figure 3 with medium jordaning.

**HOW FIBER DEVELOPMENT IS ACHIEVED AND CUTTING MINIMIZED.** Morden's unique reverse-flow principle, with opposing internal flow pressures, **provides a constant cushion of stock between the shell and rotor bars,** permitting maximum brushing and fraying, with minimum cutting of the fiber. SEE FIGURE 5. Result: GOOD MULLEN and EXCELLENT TEAR RETENTION at MINIMUM FREENESS DROP, INCREASED MACHINE SPEED & DRYER CAPACITY FOR INCREASED DAILY PRODUCTION.

**POWER SAVINGS.** Over and over again customers tell us that Morden Stock-Makers provide better stock treatment, yet consume less power . . . **in some cases savings up to 50% are reported.** A 400 H. P. MORDEN BIG 8 uses only 70 to 90 of its connected H. P. for idling load, leaving 310 to 330 H. P. for efficient stock treatment. Compare this efficiency with any other conical refiner, where usually up to 50% of applied energy is consumed for idling load.

**LOWER INVESTMENT COST.** When all other costs are going up, Morden has improved the design, retained the efficiency but has reduced the cost approximately 20%. Built-in motor is a cost and space-saving option.

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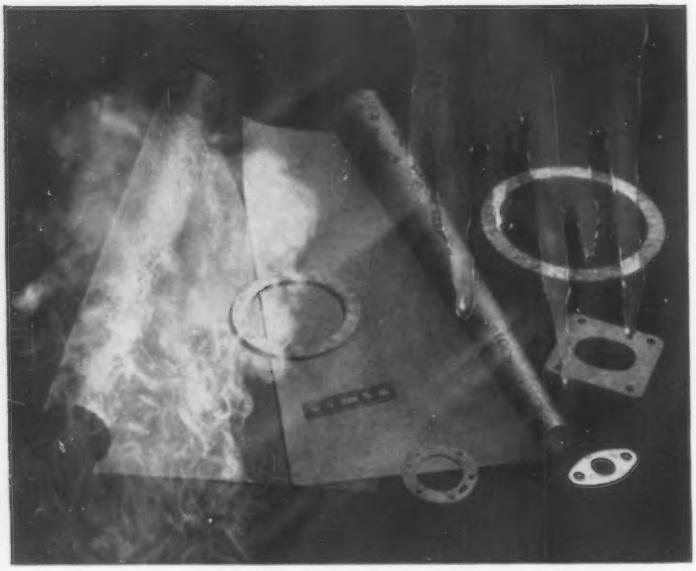
## GASKETS
for Paper
Mills



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**In rubber sheet form, Garlock offers Style 7986** Neoprene sheet for flanged joints where oil resistant qualities of neoprene are required; **Style 8495** Buna-N sheet for gasketing against oils and solvents at temperatures up to 300°F; **Style 7992** Neoprene rubber diaphragm sheet for wet natural gas, gasoline, oils at medium or high pressures; **Style 9296** Silicone-Dacron diaphragm sheet for hot or cold air, high aniline point oils and many fire resistant fluids such as cellulube at temperatures up to 300° as cellulube at temperatures to 300°F.

**For prompt delivery,** complete gasket cutting facilities are available in Palmyra, N. Y., Philadelphia, Pa., Houston, Tex., San Francisco, Calif., and Hamilton, Ontario, Canada. Get details by contacting the nearest of the 26 Garlock sales offices and warehouses throughout the U. S. and Canada. Or, write Garlock Inc., Palmyra, N. Y.

# GARLOCK

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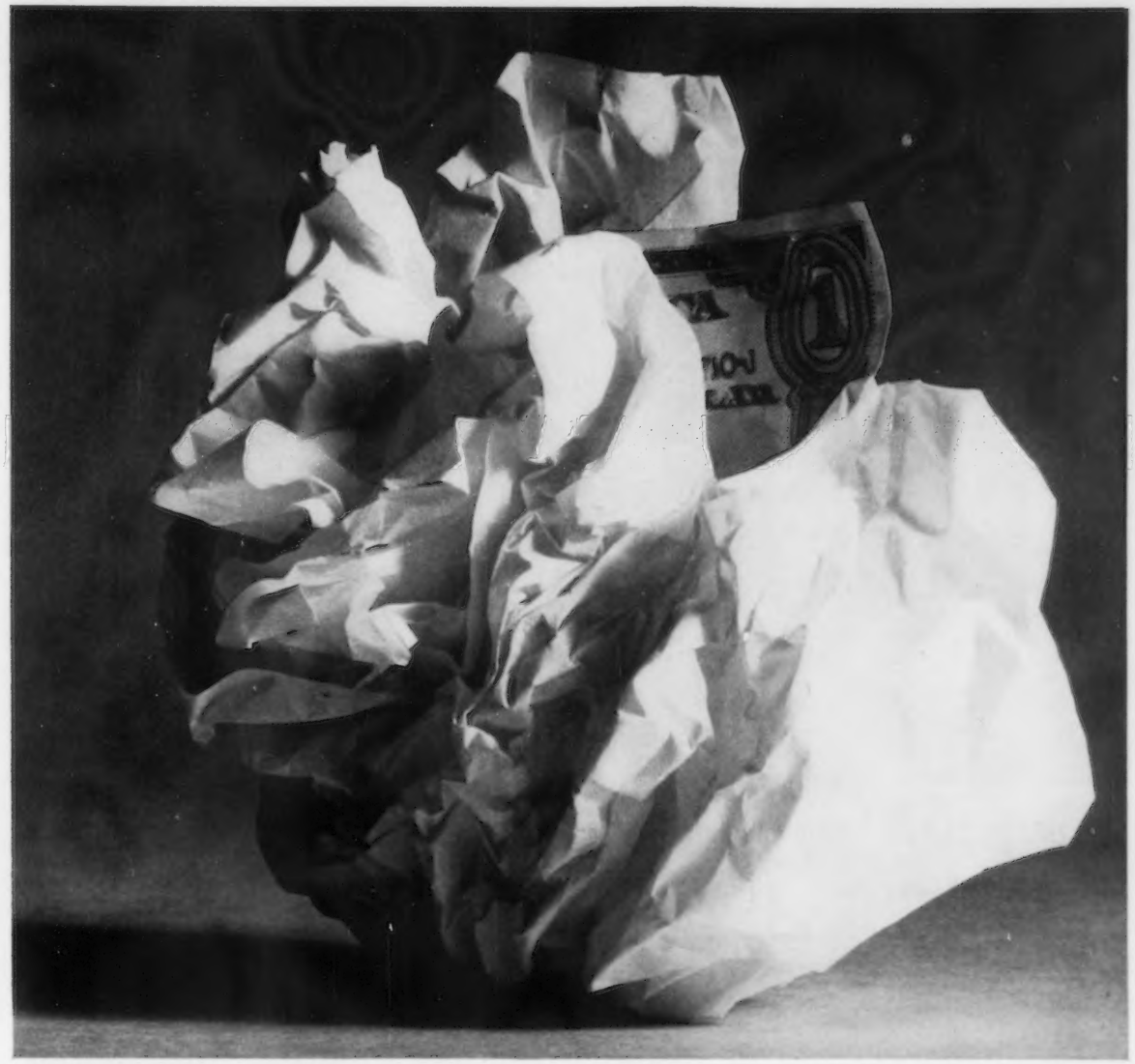

**MORE THAN** paper is thrown away when the efficiency of the size has not been fully realized. Time and money are also wasted. Don't let your mill face these losses. Consider Cyanamid's **high quality rosin sizes**—fortified and unfortified, liquid and dry—for dependable, cost-saving performance. And in back of Cyanamid's **high quality rosin sizes** are those all-important hidden ingredients... Cyanamid's extensive manufacturing and research facilities, and the skilled personnel who man them. Your Cyanamid salesman, with his technical training and paper-making knowledge, is truly your partner in paper progress. Ask him to give you complete information about Cyanamid's **high quality rosin sizes.**

CYANAMID

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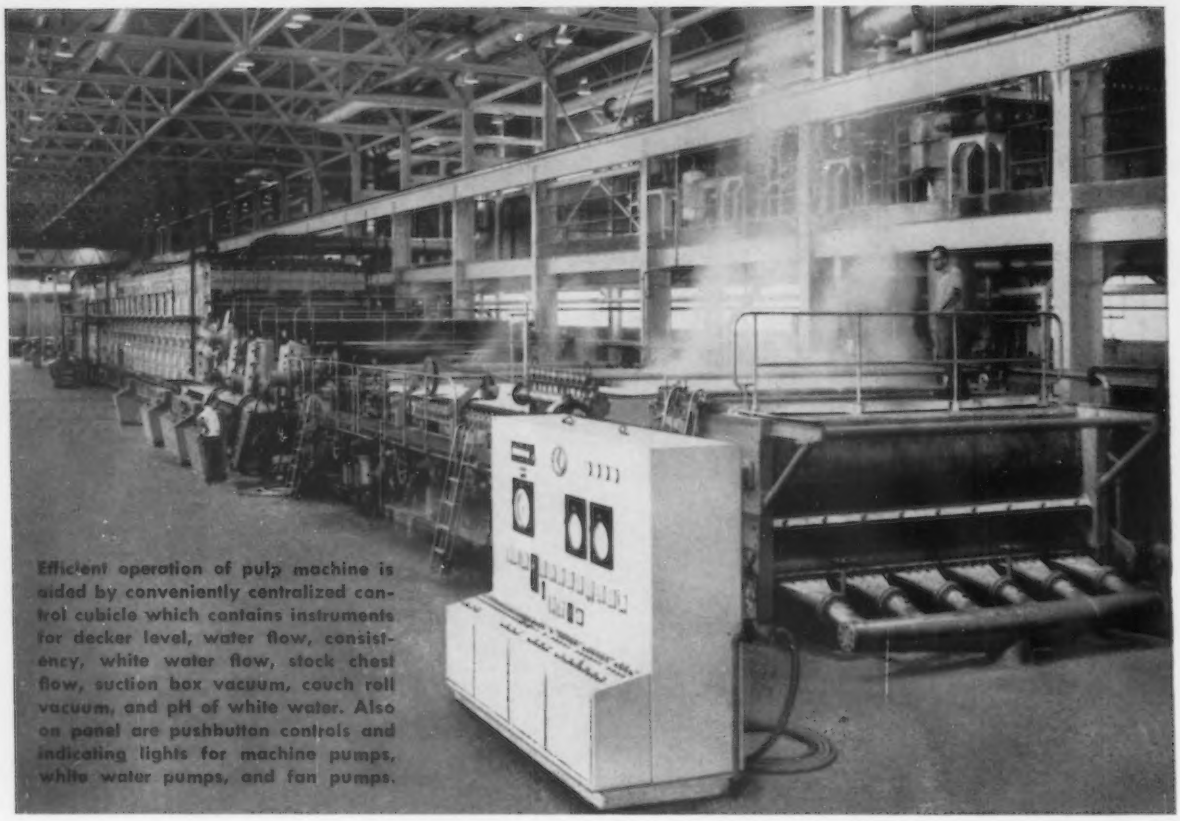
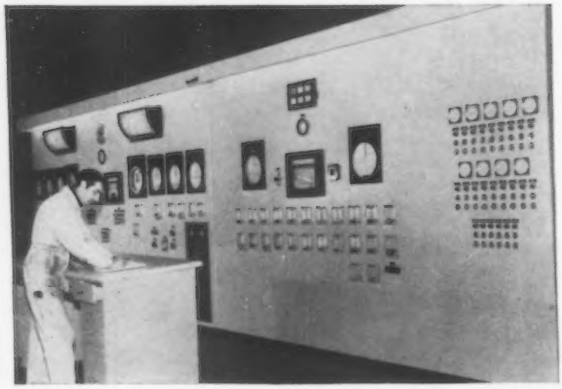


Efficient operation of pulp machine is aided by conveniently centralized control cubicle which contains instruments for decker level, water flow, consistency, white water flow, stock chest flow, suction box vacuum, couch roll vacuum, and pH of white water. Also on panel are pushbutton controls and indicating lights for machine pumps, white water pumps, and fan pumps.

# Pushbutton pulping boosts quality and production at new Alaska mill



Controls for recovery boilers and liquor evaporators are grouped on one panel. Throughout the process, all variables are precisely measured and controlled, so that the mill can produce consistently high grade alpha cellulose with maximum economy and efficiency.

Honeywell controls make pulping completely automatic at the new sulfite mill of Alaska Lumber & Pulp Company, near Sitka. Built to supply cellulose to Japan's rayon industry, the mill daily produces 340 tons of top grade dissolving pulp, and is a fine example of the efficiency and quality control that inevitably result from modern instrumentation.

Controls for each application were chosen from the complete line of Honeywell instruments. Cam programmers automatically steam all digesters. In the acid plant, *ElectroniK* instruments record burner temperatures measured by *Radiamatic* radiation detectors, and various temperature and flow controllers regulate liquor evaporators and recovery boilers. In the washing operation, *Tel-O-Set* miniature instruments control shower water flow and filtrate tank level. In the bleachery, ratio controllers accurately add bleach in relation to pulp flow. Automation is complete even to the *Dur-O-Pulse* telemetry system that monitors settling basin level at the filter plant and transmits the information to the turbine room panel.

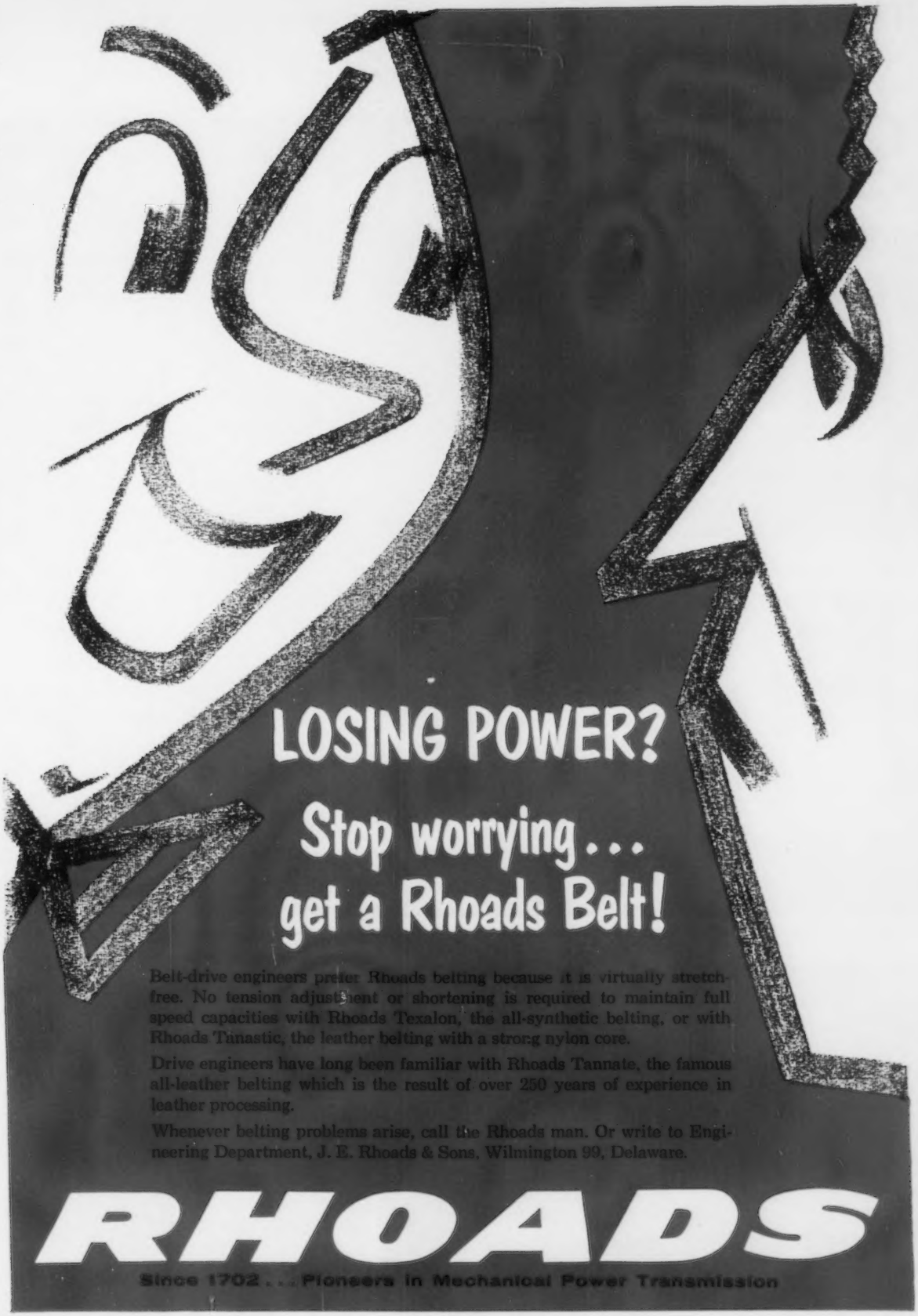
Your nearby Honeywell field engineer can help you gain the many benefits of custom-designed, modern instrumentation in your own mill. Call him today . . . he's as near as your phone.

MINNEAPOLIS-HONEYWELL, Wayne and Windrim Avenues, Philadelphia 44, Pa.—In Canada, Honeywell Controls, Ltd., Toronto 17, Ontario.

**Honeywell**

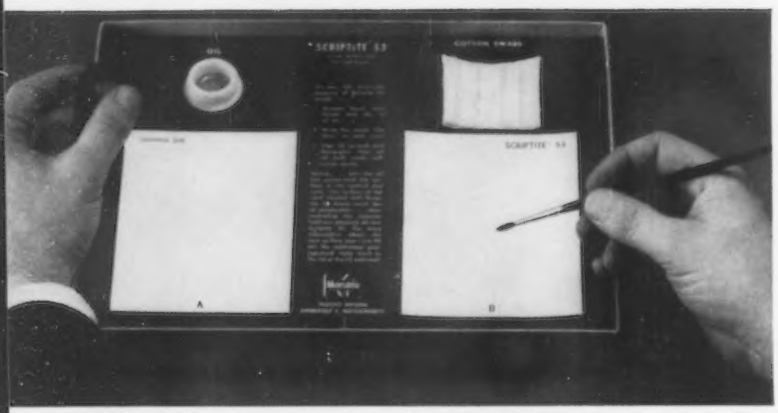
First in Control

SINCE 1885

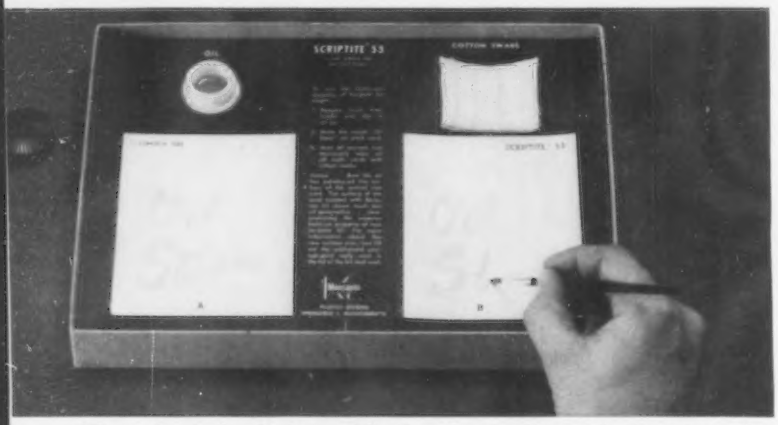

LOSING POWER?
Stop worrying...
get a Rhoads Belt!
Belt-drive engineers prefer Rhoads belting because it is virtually stretch-free. No tension adjustment or shortening is required to maintain full speed capacities with Rhoads Texalon, the all-synthetic belting, or with Rhoads Tanastic, the leather belting with a strong nylon core.
Drive engineers have long been familiar with Rhoads Tannate, the famous all-leather belting which is the result of over 250 years of experience in leather processing.
Whenever belting problems arise, call the Rhoads man. Or write to Engineering Department, J. E. Rhoads & Sons, Wilmington 99, Delaware.
RHOADS
Since 1702 . . . Pioneers in Mechanical Power Transmission

# This 30-second test proves the superior hold-out qualities of new

# SCRIPTITE® 53



Paperboard A has a starch ether surface size. Paperboard B was treated with new Scriptite 53 surface size.



OIL was brushed on both A and B, allowed to dry 30 seconds, then wiped off.

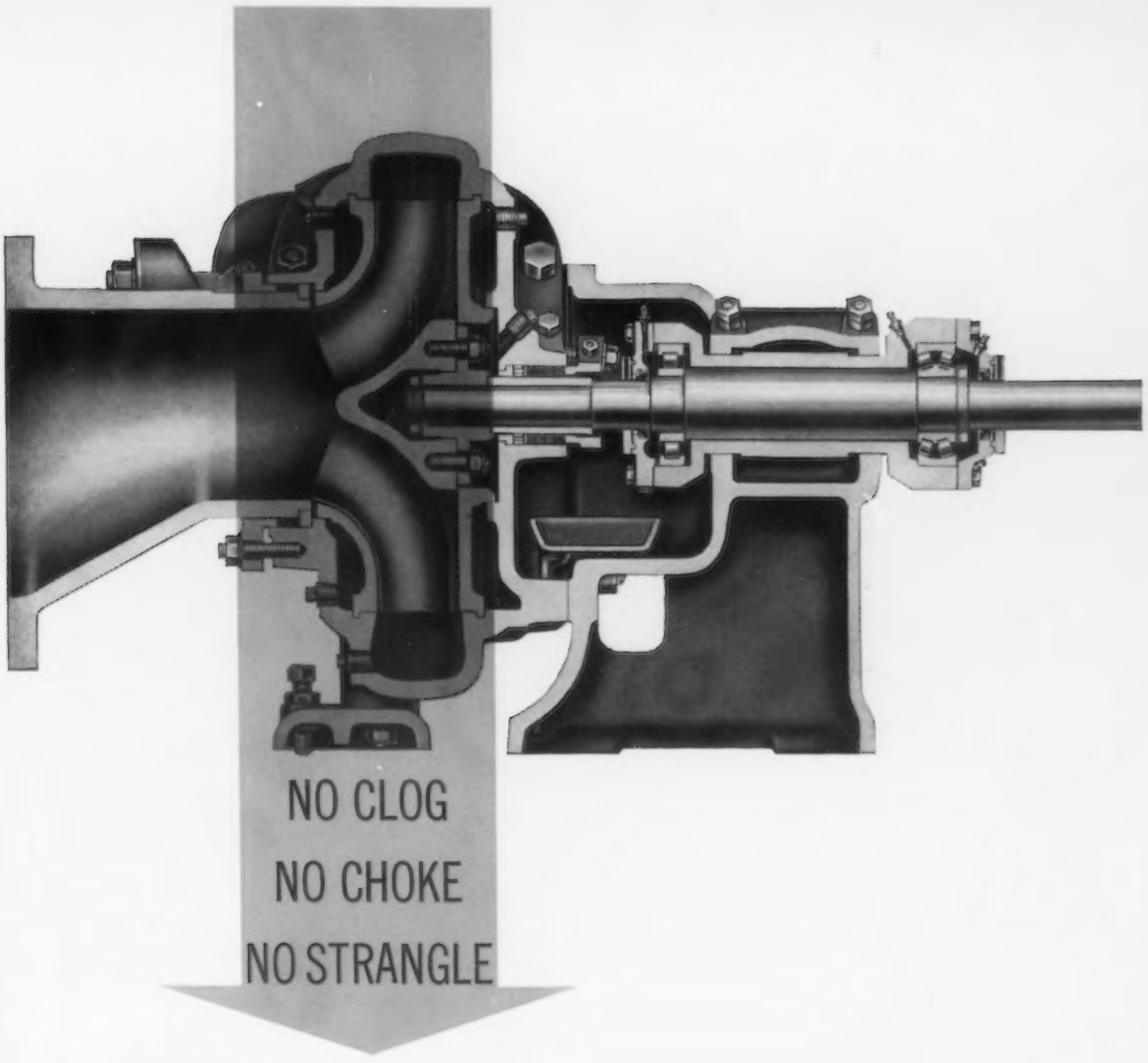
Note how oil has penetrated surface of card A far more than on card B, demonstrating the superior hold-out property of Scriptite 53. You can make this simple test yourself. Ask your Monsanto representative to show you the special Scriptite 53 test kit.

Food board has clearer, brighter appearance when it has been treated with Scriptite 53. This new Monsanto surface size improves wax hold-out on food board and light waxing grades of paper for packaging and laminating. Scriptite 53 keeps the wax coating evenly distributed on the surface of the board, stopping excessive internal penetration of the coating which gives food board a dull greyness.

Scriptite 53 has particular application for milk container and frozen food board because of its excellent lactic acid resistance. It acts as a barrier to the acid even when wax coating has been penetrated, preventing carton bulge. Scriptite 53 is exempt from regulatory provisions of the Food Additives Amendment by virtue of FDA's confirmation of "No reasonable expectation of migration when used as a wax hold-out resin." For additional data on Scriptite 53 or board samples write Monsanto Chemical Company, Plastics Division, Room 811, Springfield 2, Massachusetts.

Monsanto

**MONSANTO** INITIATOR IN **PLASTICS**




# This pump swallows paper stock whole

**Its impeller shows you why.**

The Model 3135 has an open, end suction, non-clogging impeller. Stock flows easily into its big eye, pushed along by inlet vane tips, warped to give a screw conveyor effect. The warped vanes also prevent water separation of stock, without supplemental feeding mechanisms.

Nothing catches at the eye—no fibres, strings, or other material—because there is no nut or other obstruction there. Internal lock nuts hold the impeller to the shaft flange.

Stock can't jam between the back impeller wall and the stationary side plate since both ejector and main vanes follow the same curve.

**Longer packing life.** Pump-out vanes on the impeller back also reduce pressure on the stuffing box for a greatly extended packing life.

**Restore clearance easily.** When wear occurs between impeller and suction side plate, simple external adjustment moves shaft and impeller axially towards suction side plate.

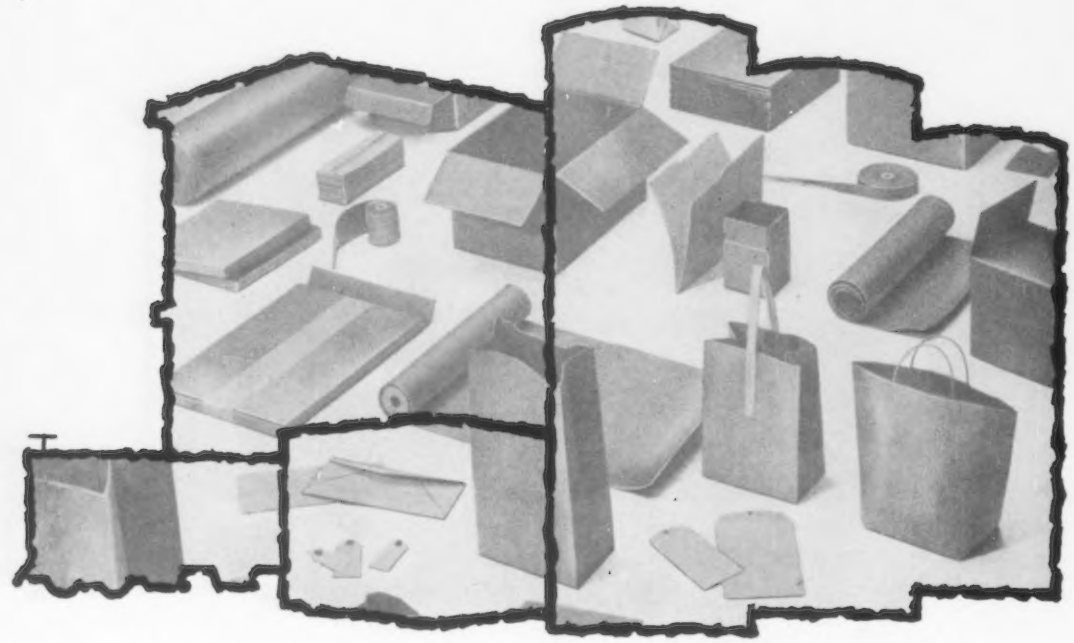
**Free bulletin** gives performance curves of Model 3135, an illustrated step-by-step description of the fast removal of the rotating element, specifications, and other useful information. Ask for Bulletin 723.1.

Goulds Pumps, Inc., Dept. PT-41, Seneca Falls, New York.

GOULDS PUMPS

# WEST END

## advance planning OF EXPANDED SALT CAKE PRODUCTION ANTICIPATES INDUSTRY'S GROWING NEEDS

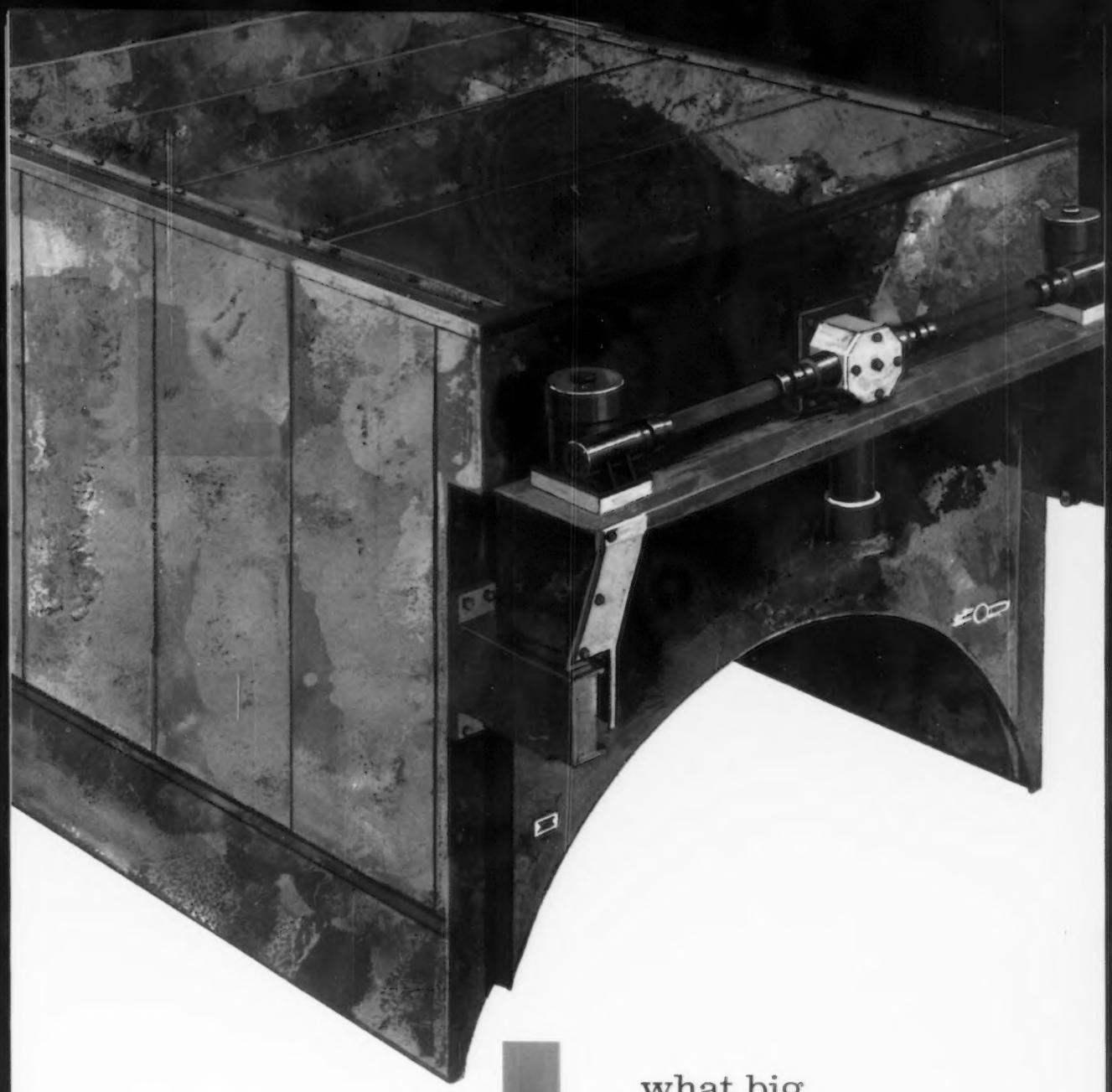


WEST END demonstrates its complete reliability as a major source by the continuing enlargement of its production facilities devoted to the manufacture of highest quality salt cake as a prime product. Independent of other product production and located at the site of vast natural raw material supply, West End is solidly qualified to handle the complete requirements of customers dependably, economically and efficiently.

Stauffer CHEMICALS

**WEST END CHEMICAL COMPANY • DIVISION OF STAUFFER CHEMICAL COMPANY**

636 CALIFORNIA STREET, SAN FRANCISCO, CALIFORNIA • PLANT: WESTEND, CALIFORNIA



what big
advantage
does the

# AIR CAP®

bring to
papermakers?

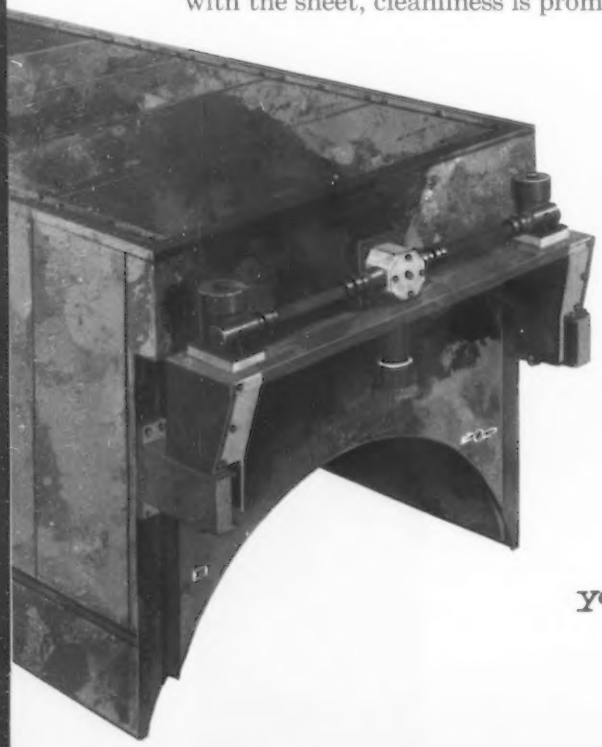
for answer, please turn page

# Beloit AIR CAP®* controls and improves board and paper drying

The Beloit Air Cap couples the drying potential of high-velocity air and a design of high efficiency. Concentrated drying capacity is combined with minimum heat and power requirements and a high degree of flexibility.

The streamlined design is of very practical significance. Beloit design minimizes the possibility of interference with the sheet, cleanliness is promoted, and freedom from distortion is assured.

Cross machine correction can be provided. Beloit's arrangement has proved most effective in maintaining uniform moisture content for coating or at the reel. A Beloit representative will be happy to analyze the papermaking and economic possibilities of applications on your machine and discuss all details involved.



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**BELOIT**

**PAPER MACHINERY**

*your partner in papermaking*

*U.S. and Foreign Patents Pending

# How To Keep Inventory Down And Maintain Felt Supply

The Albany Felt Company's **STANDING ORDER PLAN** solves two of the most pressing problems faced by mill operators today.

How to keep inventory down — and how to have the best paper machine felts on hand when needed without desperation orders or costly delays?

Now you can solve both these problems with ALBANY FELT COMPANY'S **Standing Order Plan!** The solution is as near as your Albany Felt Sales Engineer — or your telephone.

Under the **Standing Order Plan,** Albany Felt Company is authorized to ship a specified number of felts — made just for you — at regularly scheduled intervals, based on your anticipated needs. No reorders are necessary for the duration of the agreement.

Albany Felt then schedules manufacture of your felts in time to make certain that shipment dates are met. Since felts to meet your specific requirements are always in process for your future needs, you are constantly protected. Yet, the **Standing Order Plan** is flexible enough to allow for adjustment of inventory by revision of shipping dates.

If you should have an emergency, Albany Felt Company is then in a better position to quickly provide extra felts. On the other hand, if your stockpile should grow, a shipment can be delayed or omitted. Your only responsibility is for felts already woven; this number is small and agreed upon in advance.

Knowing of the protection this plan affords, you can safely reduce the felts carried in your inventory. This reduces storage space requirements and frees funds for other purposes. In addition it saves worry, paper work and possible down-time.

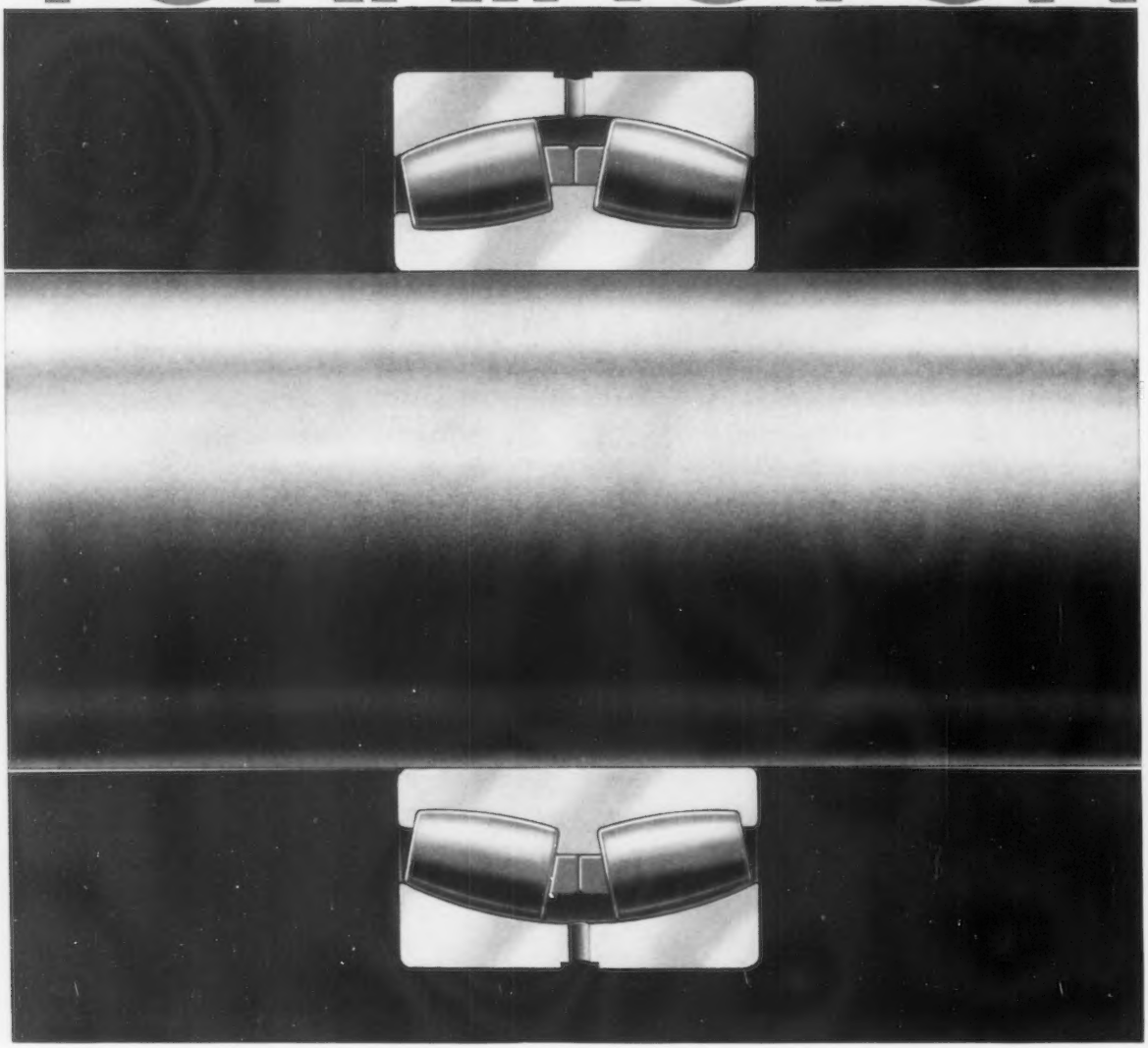
Let your Albany Felt Sales Engineer work out your **Standing Order Plan.** . . . or call today.

TALK **STANDING ORDERS** WITH YOUR

ALBANY FELT SALES ENGINEER

N. Monmouth, Maine Hoosick Falls, N. Y. St. Stephen, S. C.
Cowansville, Quebec Cuautitlan, Mexico

# TORRINGTON



## SPHERICAL DESIGN FOR SUPERIOR PERFORMANCE

Full bearing capacity with 3° total misalignment...is an outstanding feature of Torrington Spherical Roller Bearings.

Spherical design compensates *within the bearing* for both static and dynamic misalignment...offers design engineers wide latitude plus considerable savings in production costs.

Result...superior performance, higher radial and thrust-load capacity, longer bearing life.

Torrington Spherical Roller Bearings stand up when other bearings give up. They're backed by Torrington experience in making every basic type of anti-friction bearing. Buy the best...specify Torrington.

**TORRINGTON SPHERICAL ROLLER BEARINGS**
offer these features:

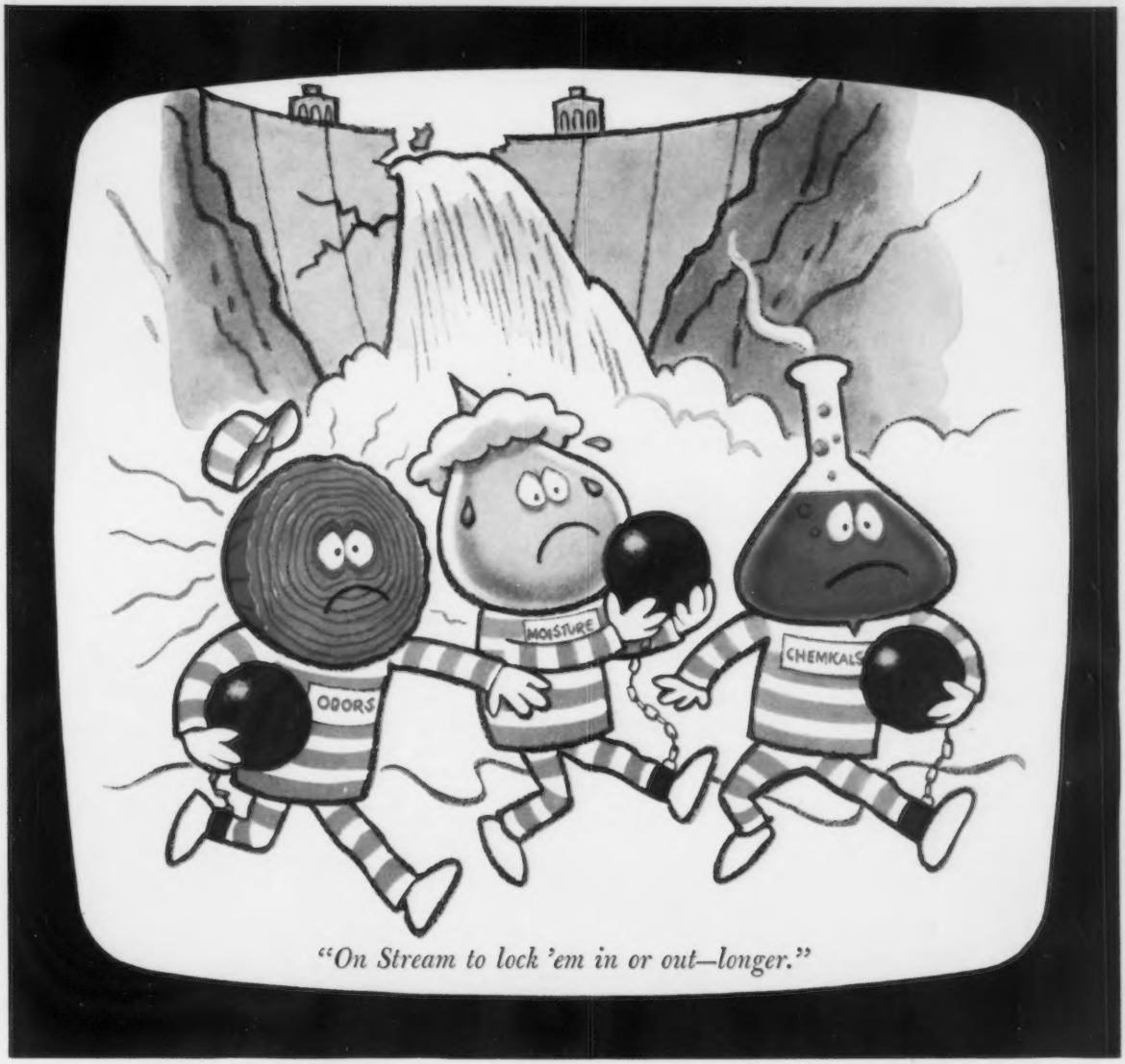
- ☐ integral guide flange for roller stability
- ☐ asymmetrical rollers seek flange for positive guidance
- ☐ electronically matched rollers
- ☐ size-stabilized races
- ☐ fully machined land-riding bronze cages
- ☐ controlled internal clearances
- ☐ even load distribution
- ☐ inherent self-alignment
- ☐ long service life

*progress through precision*

**THE TORRINGTON COMPANY**

**TORRINGTON BEARINGS**

South Bend 21, Indiana • Torrington, Connecticut




*"On Stream to lock 'em in or out—longer."*

# 14,000,000 LBS. RESYN® 3600

## POLYVINYLIDENE CHLORIDE LATEX FOR PROTECTIVE COATINGS

Our 14,000,000 pound RESYN 3600 plant is now "on stream" at Meredosia, Illinois. This marks the first commercial production of National's water dispersed polyvinylidene chloride and brings combined capacity at Meredosia to more than 80 million pounds of polymer emulsions and latices annually.

RESYN 3600 promises a revolution in protective coatings with simple low cost application by high speed coating machines or spraying. Its barrier properties are exciting and exceptional:

MOISTURE—Moisture vapor transmission is 2½ to 5 times lower than that of polyethylene. ODORS—Resistance to transmission of common gases 1000-2000 times greater than polyethylene. CHEMICALS—Almost complete non-reactivity to concentrated acids, solvents, alkalies and other corrosive materials. Completely resistant to grease and oil. Fire retardancy is excellent.

RESYN 3600 can be coated on paper, paperboard, plastic and other substrates. It also may be applied to fibers. It is of interest to a broad range of industries, including food and other types of packaging, converting, chemical, and textile. Call or write your nearest National office for full information.

**National RESINS** NATIONAL STARCH and CHEMICAL CORPORATION

750 Third Avenue, New York 17 • 3641 So. Washtenaw Avenue, Chicago 32 • 735 Battery Street, San Francisco 11

And All Principal Cities in the United States, Canada, England and Mexico

# TERRIFIC!

## — and how long will the

## flexing member last?

Good question. The heart of Para-flex is a tire with synthetic tension members bonded together in rubber — which provides a flexing body that automatically compensates for *all combinations* of misalignment and end float, and absorbs vibration as well!

This amazing coupling has now been used in American industry 4 years. Thousands are in operation — in food processing plants, paper mills, chemical plants, textile mills, everywhere — and in these 4 years, replacements of elements have been negligible.

Dodge Standard Para-flex takes angular misalignment up to 4°, parallel misalignment up to ⅛" and end float up to 5/16" depending upon the size of the coupling and the duration of shaft displacement.

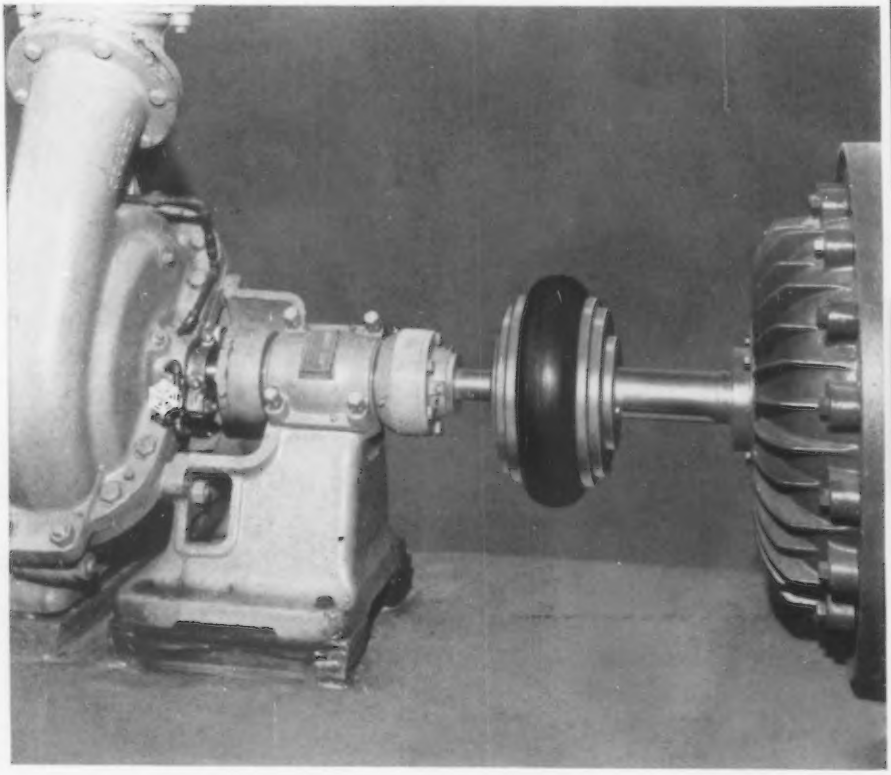
Dodge Para-flex is available in 3 types — Standard, Flywheel and High Speed (shown at right). The Standard type is stocked in capacities up to 3640 hp at 910 rpm. Ask your Dodge Distributor, or write us for complete technical bulletin.

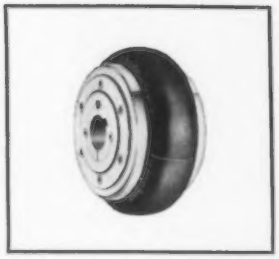
Dodge Manufacturing Corporation, 2900 Union Street, Mishawaka, Indiana

*The Products with the Pluses . . .*

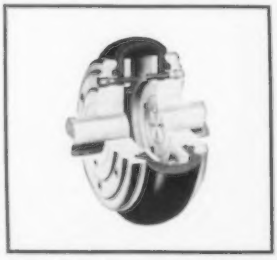
**DODGE**

*of Mishawaka, Ind.*





The new idea in flexible cushion couplings, with a flexing member that "swallows up" misalignment.



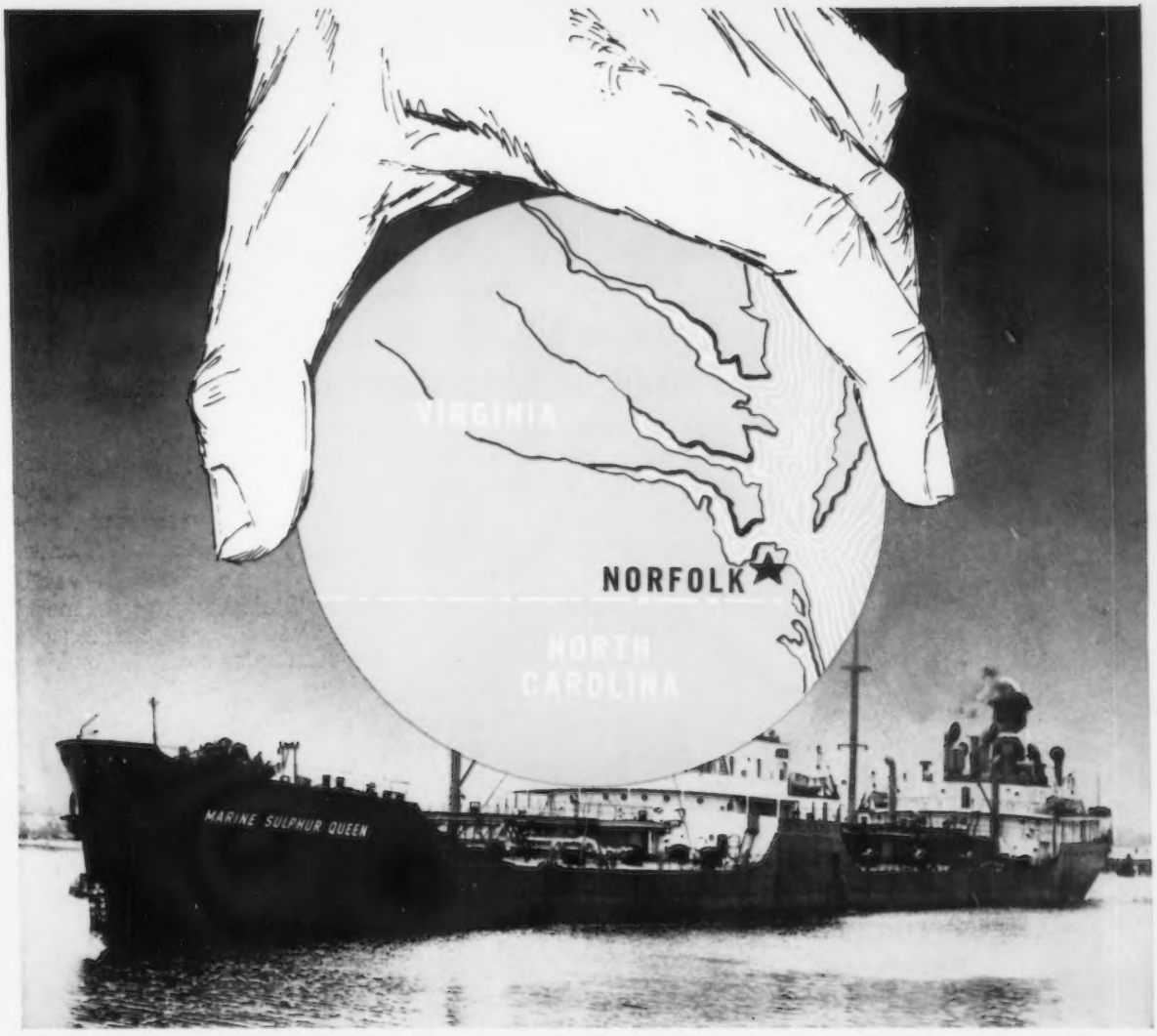
No lubrication, no maintenance. Replace flexing element without moving driver or driven machine.

Flywheel and High Speed Types. For use with motors and internal combustion engines turning up to 5230 rpm.

DODGE

**Para-flex**

**CALL THE TRANSMISSIONEER,** your local Dodge Distributor. Factory trained by Dodge he can give you valuable assistance on new cost-saving methods.




# add NORFOLK, VIRGINIA... to the growing list of TGS local distribution terminals for MOLTEN SULPHUR.

And how does Norfolk keep its 20,000 gross ton storage capacity stocked well ahead of demand?

By our new 15,000 ton tanker, the Marine Sulphur Queen, which on a 10 to 12 hour turn around schedule takes on cargo at our new large main supply terminal at Beaumont, Texas. From Norfolk we are supplying Mid-Atlantic plants by tank car and tank trucks.

As part of a broadening program of molten sulphur deliveries, TGS is now operating several large distribution terminals located in major sulphur consuming areas.

**Carteret—molten • Cincinnati—molten**
**Norfolk—molten, solid • Tampa—molten, solid**
Other terminals are in the planning stage.

**TEXAS GULF SULPHUR COMPANY**
75 East 45th Street, New York 17, N. Y.
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*Sulphur Producing Units:*
NEWGULF, TEXAS • MOSS BLUFF, TEXAS • FANNETT, TEXAS
SPINDLETOP, TEXAS • WORLAND, WYO. • OKOTOKS, ALBERTA, CANADA

(PHOTO): The MARINE SULPHUR QUEEN heading into Norfolk.

# *Now...Change the Guard with new*

## DEWEY AND ALMY

# DARAN

*(polyvinylidene chloride emulsion)*

## Creates New Uses and Profitable New Provides Unprecedented Packaging

Out of Dewey and Almy's long experience and leadership in polymer research comes DARAN—a revolutionary new high barrier coating for paper packaging.

DARAN coatings, applied on conventional equipment, are virtually impermeable to air, greases, gases, water, moisture, acids, alkalies, and solvents.

DARAN enables paper to compete profitably with glass, metal and plastics . . . eliminates separate glassine liners, replaces expensive foil laminates, outperforms extruded coatings for high barrier applications!

GIVES UNEXCELLED PROTECTION FOR ALL KINDS OF PRODUCTS . . . from cookies and cereals to milk and dehydrated soups . . . from fresh and frozen foods to sauces and syrups . . . from chemicals and cement to drugs and photographic film . . . from fertilizers and insecticides to cosmetics, tobacco and soap. On bags, boxes, cartons and shipping drums, DARAN makes paper do packaging jobs paper never could do before!

### GRACE LEADS IN PACKAGING PROGRESS

W. R. Grace & Co. has demonstrated consistent leadership in the research and development of new concepts in packaging. Among these achievements are CRYOVAC packaging films . . . DAREX "Flowed-in" gaskets and sealants . . . GREX polyethylene. Now, through its Dewey and Almy Chemical Division, Grace sets the pace in high barrier paper coatings with DARAN

W. R. GRACE & CO.

GRACE

DEWEY AND ALMY CHEMICAL DIVISION
*Cambridge 40, Massachusetts*

DARAN BARS WATER, MOISTURE, AIR, GREASE, SOLVENTS, ALKALIES, ACIDS —LOCKS IN AROMAS, FLAVORS.

# high barrier coating

## Markets for Paper and Paperboard Packaging
## Protection... Substantially Lowers Coating Cost.

DARAN'S uniquely high 60% solids content (as compared with 40-50% for conventional polyvinylidene chloride coatings) means less drying time, better utilization of equipment. Material requirements are reduced by as much as 60% with DARAN. You save up to 50% in over-all coating costs.

**DARAN outperforms extruded coatings.** In high barrier applications, DARAN gives more than twice the barrier protection of extruded coatings... at half the cost.

**DARAN is more efficient.** One coat gives good grease and moisture resistance; two coats give maximum resistance to water, grease and air.

**DARAN goes on faster, dries faster.** With its higher solids content, combined with modern coating and drying techniques, DARAN gives higher gloss – top barrier properties – at higher production speeds!

**DARAN is easy to apply.** Requires no special preparation, no special coating or extrusion equipment. DARAN is applied exactly as supplied and can be used with standard multi-purpose coating machines. And since DARAN is water based, there is no fire or explosion hazard.

**DARAN prints without pretreatment.** High sheen, attractive DARAN coated paper prints without pretreatment, adds counter and shelf appeal to any package. Stimulates impulse sales. DARAN coated packages provide greater label space, too. The entire package surface is printable, either before or after coating with DARAN.

**OPENS NEW MARKETS — CUTS COSTS — IMPROVES PROFITS**
In almost every packaging field, DARAN offers profitable new marketing opportunities. It will pay you to find out what DARAN can do... *what it can do for you.* Write for complete information. Our technical staff is at your service.

*MAIL COUPON TODAY*

Dewey and Almy Chemical Division
W. R. Grace & Co.
62 Whittemore Ave., Cambridge 40, Mass.

Please send me samples and complete information on DARAN.

Name_____

Company_____

Address_____

City_____ Zone____ State_____

# Avoid this $60-a-minute downtime

**READ HOW TEXACO'S NEW "STOP LOSS" PROGRAM CAN HELP ELIMINATE UNSCHEDULED DOWNTIME . . . HELP INCREASE NET PROFITS AS MUCH AS 8.8%***

**Organized lubrication** is just about your best guarantee against costly, unscheduled downtime. A Texaco "Stop Loss" program completely organizes lubrication practices throughout your mill—from purchasing and inventory to actual application.

**Texaco lubrication engineers,** working with your own engineers, specify the right lubricants, lubrication intervals and procedures for your entire operation. Your circulating oil system is checked for top efficiency. Procedures are recommended to handle water contamination. A fool-proof system of follow-through is set up to guard against dangers of misapplication or overlooking lubrication points.

**Results?** Drastically reduced downtime. Longer bearing life. A reduction in maintenance costs up to 10%—and more. *This can mean the equivalent of an 8.8% increase in profits from maintenance savings alone.**

Find out today how your mill can benefit from a "Stop Loss" program. Send for our informative folder: "How to Starve a Scrap Pile." Write: Dept. P.T. 33.

Texaco Inc., 135 East 42nd Street, New York 17, N.Y.

**The U. S. Department of Commerce* estimates that a paper mill doing a $10,000,000 yearly business will spend about $650,000 for maintenance. A 10% reduction in maintenance costs would amount to $65,000. Assume that profits average 7.34%—or $734,000. By adding the 10% maintenace saving, profits now total $799,000 . . . an 8.8% increase.

**TEXACO**

*Throughout the United States*

*Canada • Latin America • West Africa*

LUBRICATION IS A MAJOR FACTOR IN COST CONTROL

# How Solvay's

# Miniature Mill can help you...

Send samples of your raw stock to Solvay Technical Service. They will refine it to your specifications and evaluate its papermaking characteristics by using equipment which duplicates the results you can obtain in your mill.

Service like this is part of the package when you deal with Solvay. You get help from graduate engineers with practical experience in the paper industry. For example, if you're concerned about your bleaching set-up, get their recommendations. You can be sure they'll suggest the best sequence for you because Solvay offers all four bleaching methods.

Call your nearest Solvay representative to get this team working for you.

**SOLVAY® CHEMICALS FOR THE PAPER INDUSTRY**
Caustic Soda • Chlorine • Hydrogen Peroxide • Soda Ash

Allied Chemical

**SOLVAY PROCESS DIVISION**
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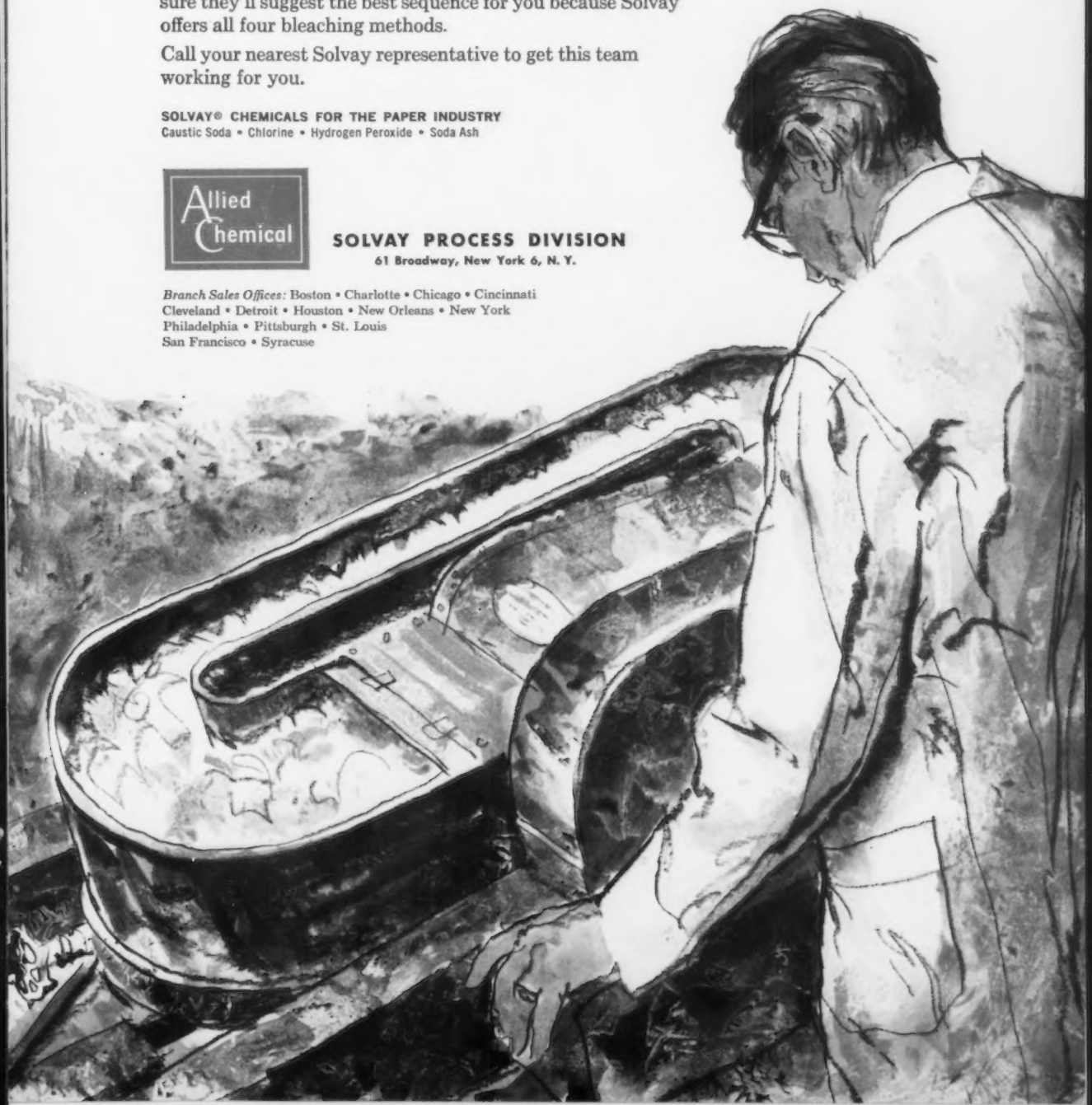

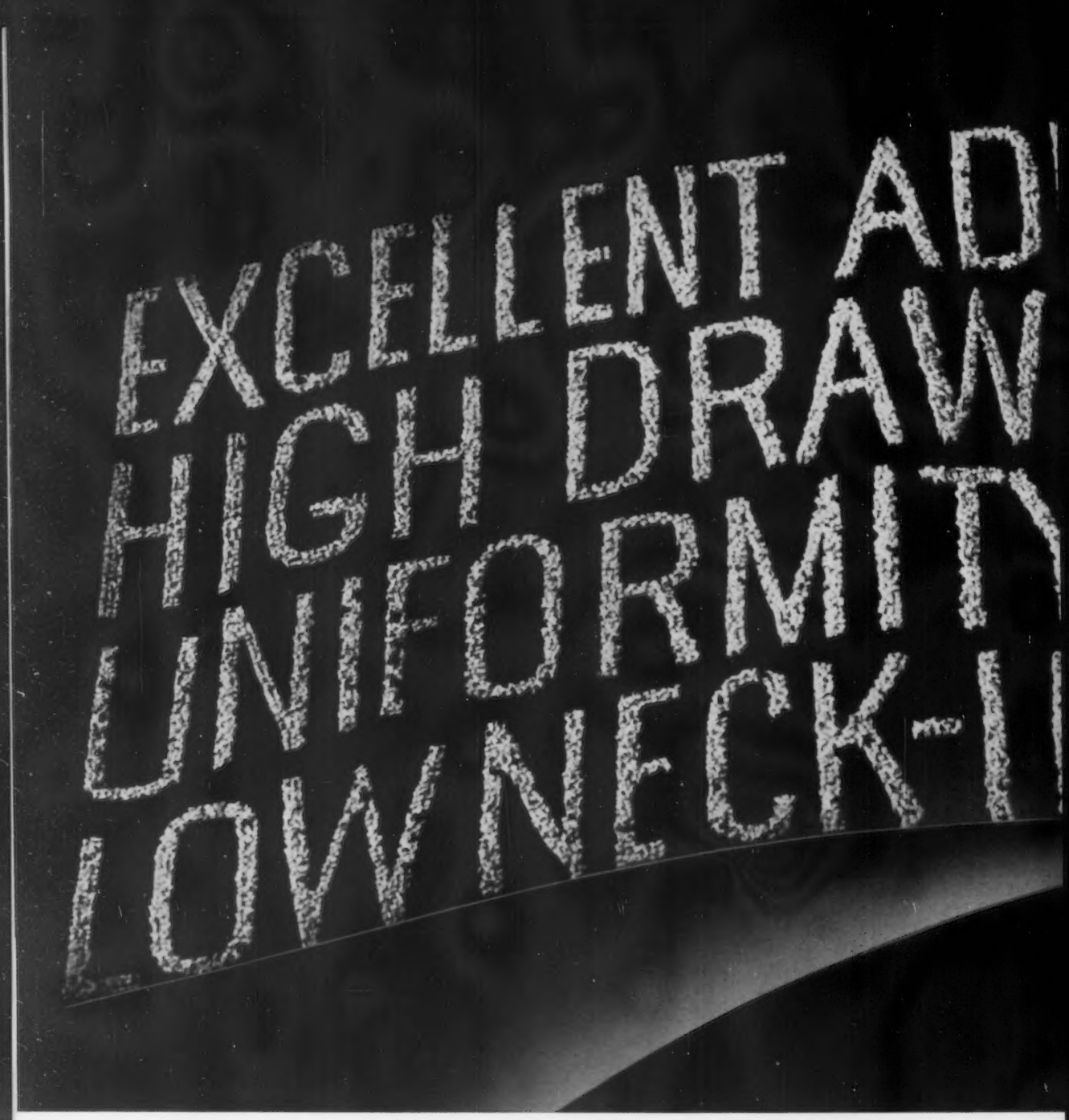


## THE ONE COATING RESIN YOU CAN'T BEAT FOR PROCESSABILITY... AND VERSATILITY—PETROTHENE® 205-15 POLYETHYLENE

At last . . . one coating resin that offers the properties most wanted by both extruders *and* users of coated substrates. It's U.S.I.'s PETROTHENE 205-15 polyethylene resin (density 0.924, melt index 3)—an easily-handled, good-working resin which adheres exceptionally well to a wide range of porous and non-porous substrates.

**High greaseproofness at economically low coating weights** is an outstanding characteristic of the new resin. It reaches 100% passage of Military Specification MIL-B-121B at lower coating weights than other polyethylene resins of similar or even higher density.

Good flow characteristics make PETROTHENE 205-15 adaptable for medium and high speed coating. Coatings as thin as 0.5 mil can be applied; however, thicker coatings are normally recommended to attain desired properties. Neck-in is reduced to a minimum and polymer build-up virtually eliminated. Treatment, in applications which require printing, can be carried out in line at high production speeds.

Here are some reasons why PETROTHENE 205-15 is used in these applications: Multiwall bags – moisture vapor resistance, low beading; foil – good adhesion, heat sealability, low beading; bakery and frozen food cartons – greaseproofness; cellophane – adhesion, heat sealability; military packaging – greaseproofness, heat sealability.

PETROTHENE 205-15 has the best balance of properties of any polyethylene coating resin commercially available. U.S.I. offers a variety of extrusion coating resins to fit any specific requirements. For more information on PETROTHENE 205-15 polyethylene or other coating resins, write or phone U.S.I. today.

**PETROTHENE 205-15 POLYETHYLENE**

**FOR** Cellophane • Polyester • Glass Fibers (Scrim cloth) • Foil • Paper • Paperboard • Acetate • Parchment

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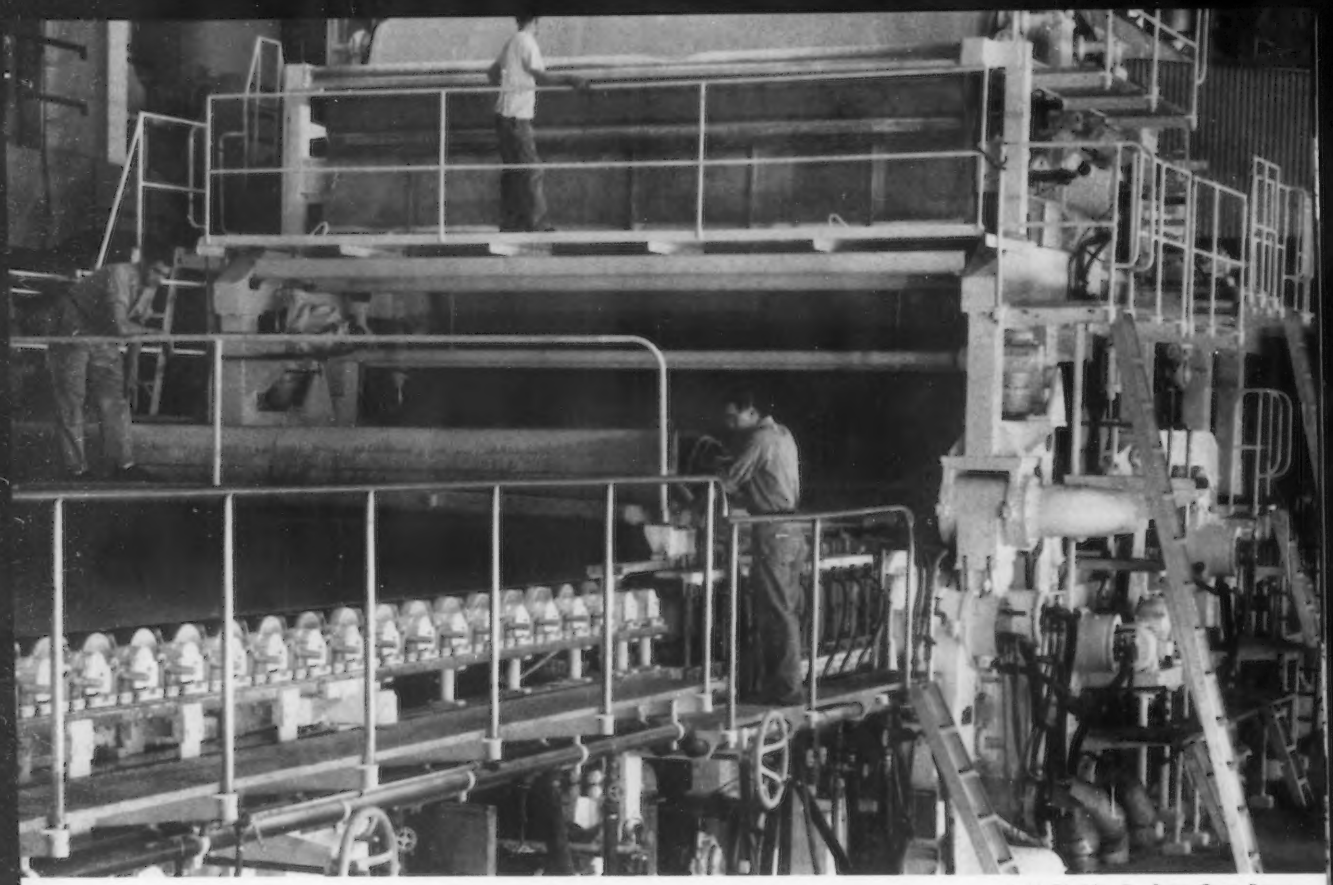

P. H. Glatfelter Co., Spring Grove, Penna.

# How 5 grade changes a day make Glatfelter more competitive

Flexibility is synonymous with Glatfelter's No. 7 188″ machine. Their ability to make up to 5 changeovers ranging from 13 lb. bond to 110 lb. drinking cup stock means orders are shipped within hours, overruns are unnecessary and warehousing is eliminated. Rice Barton engineering has provided this versatility which makes short runs profitable and improves the mill's competitive position.

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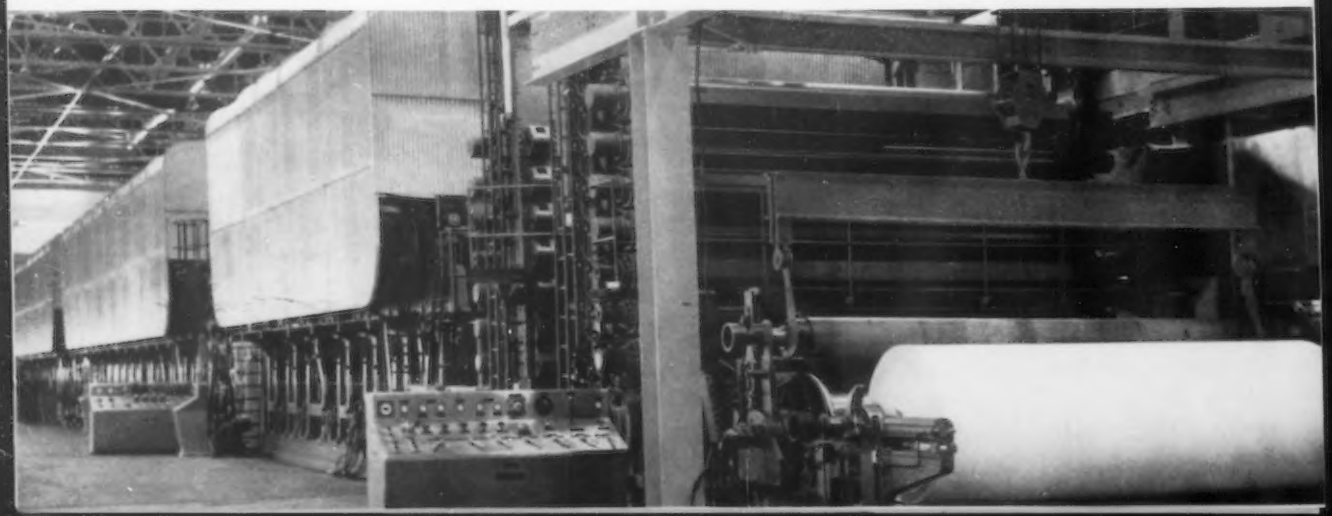

PAPER TRADE JOURNAL

WEEK OF APRIL 10, 1961

# Strathmore Rebuilds Machine in Woronoco

The Strathmore Paper Co. has announced that it will completely rebuild its No. 6 papermaking machine in Woronoco late this summer. Strathmore recently completed its new power plant in Woronoco, built to handle the increased capacity of the new machine.

Company officials estimate that by the time the No. 6 machine is completed, Strathmore will have spent close to $2,500,000 on these Woronoco installations. The No. 6 machine, one of three at the Woronoco mills, produces bond, blueprint, tracing, diazo or white print, and photographic base papers.

Henry D. Johnston, president of the company, which also has mills in West Springfield and Turners Falls, and a large central shipping department in Westfield, described the new major expenditure as "part of a continuing Strathmore program of modernization designed to develop greater efficiency, and to enable the company to expand and strengthen its position in the highly competitive paper industry."

Mr. Johnston said that when the rebuilt 250-foot-long machine is completed later this year, Strathmore will have spent almost $10,000,000 since 1953 on the modernization of plant and production facilities at its four locations.

The Manchester Machine Co. of Middletown, Ohio, has been given the contract to design the new machinery according to Strathmore specifications. It is anticipated that all of the equipment will be available by mid-August, and Strathmore officials plan to complete the installation within six weeks, working on an around-the-clock basis.

Mr. Johnston said the machine is being redesigned to make paper at a top speed of 750 feet a minute, compared with the present maximum of 500 feet a minute. As part of the complex rebuilding operation, the wire length of the fourdrinier—on which the paper is formed—is being increased from 50 to 75 feet, and 13 new drying drums and a new machine sizing unit will be added. The new machine, when finished, will be approximately 60 feet longer than its current counterpart, improvements are also being planned in the preparation of stock used to make the paper.

"Structural changes in the No. 2 Woronoco Mill will be required," Mr. Johnston said, "but these will be accomplished before the work on the machine gets under way."

## Tennessee River Starts Up New Container Board Mill

Tennessee River Pulp and Paper Co.'s new pulp and paperboard mill at Counce, Tenn., has just gone into operation with the almost immediate production of good board. Located slightly northwest of the point where the Tennessee, Mississippi and Alabama state lines meet, the $30 million project was started in May, 1959.

The plant includes a kraft pulp mill and a 240-inch trim fourdrinier designed for the production of 500 tons per day of containerboard. The firm is headed by G. W. E. Nicholson, president. Resident manager is E. M. Leavitt.

The new mill will be the subject of a feature article to appear soon in a forthcoming issue of PAPER TRADE JOURNAL.

## Paper and Paperboard Production

The American Paper and Pulp Association reported the ratio of the United States paper production to mill capacity for the week ending March 25, 1961, at 90.7 per cent, compared with 91.2 per cent, revised, for the preceding week. The ratio was 99.0 per cent for the corresponding week a year ago.

The National Paperboard Association reported the paperboard production ratio for the week ending March 25, 1961, at 91 per cent, compared with 91 per cent for the preceding week and 93 per cent for the corresponding week a year ago.

*(Detailed Statistics on page 66)*

## Simpson Lee Schedules July Operations at Ripon

Paper making operations are expected to begin in July at Simpson Lee Paper Co.'s new $8 million paper mill near Ripon, Calif. Located just south of the city limits, the mill includes a 120-inch trim fourdrinier and will have a capacity of 50 tons a day. It will produce high grade papers such as tracing paper, base papers for blue prints, photographic base paper and text paper.

The mill building is complete, and the boiler house will be finished in May. Electrical service including incoming lines, sub-station, switch gear house, and distribution and motor control centers, all are in the final stages. The machine drainage system for recovering condensate from dryers now is being installed.

## Kimberly-Stevens Buying Plant in Connecticut

Kimberly-Clark Corp. has announced that it is negotiating for the purchase of a 3-acre site with 200,000 square feet of vacant plant space at New Milford, Conn., to be used for the production of nonwoven fabrics developed by its subsidiary, Kimberly-Stevens Corp.

The subsidiary's nonwoven fabrics include paper cloth that is being developed for a wide number of applications for clothing and other material to be used in place of conventional fabrics.

The Connecticut facility will be the first full scale production plant for Kimberly-Stevens Corp. It has been producing its nonwoven fabrics in small quantities at its R. & D. center at Westfield, Mass.

NEW HIGH BARRIER PAPERBOARD just put into production by Potlatch Forests gets once over from, left to right, M. G. Kuhlman, technical director; Vance V. Vallandigham, vice president for pulp and paper; and Donald T. Keller, production manager.

# Potlatch Begins Commercial Production Of New Type High Barrier Paperboard

Commercial production of a new type of high barrier paperboard has just been announced by Potlatch Forests, Inc., Lewiston, Idaho. This is the first time a material of this type has been available for packaging use in the Western Hemisphere. A coating of polyvinylidene chloride applied as a water base emulsion provides its exceptional barrier properties. The emulsion, trademarked "Daran," is a recent development of the Dewey and Almy Chemical Division, W. R. Grace & Co., and is said to hold promise of being the most significant advance in the art of imparting characteristics of plastics to paper since the introduction of extrusion-coated polyethylene in 1949.

Potlatch is the first U. S. paper manufacturer to produce the high barrier board in commercial quantities. Plans call for early production of high barrier papers as well. The company said the new paperboard provides the packaging industry with an economical material which has high resistance to moisture, grease, air, gases, odors and many acids, alkalies and solvents. Packages made of it help to retain the original freshness, aroma and flavor of food products.

Announcing the new board, Vance V. Vallandigham, vice president, Pulp, Paper and Converting Division, said "Introduction of this paperboard rested on the successful application of an adequate barrier coating. The recent development of Dewey and Almy's new polyvinylidene chloride emulsion enabled us to impart the high barrier properties of saran-type plastics to paper and paperboard at modest cost."

Initial Potlatch production is expected to be converted to bakery boxes, meat trays, picnic plates and cups and similar items.

## Tenth Statistics Course Scheduled for June

The Tenth Statistics Course will once again be sponsored jointly by TAPPI and the Technical Section, Canadian Pulp and Paper Ass'n and will, for the third time, be held in Canada. The dates of the course are June 19 to 30, 1961, and the location will be Queen's University, Kingston, Ontario.

Further details, application forms, etc., may be obtained by writing Douglas Jones, executive secretary, Technical Section, Canadian Pulp and Paper Ass'n, 2280 Sun Life Building, Montreal 2, P.Q., Canada.

## CPPA, TAPPI, PIMA Set Date for Tri-Way Meeting

At least 450 members of the pulp-paper-paperboard industry and allied services representatives are expected at the international tri-way meeting to be held May 4-6 in Harrison Hot Springs, B.C. This is the joint meeting of western branches of CPPA, TAPPI and PIMA.

The convention program, developed with a view to the needs of today's rapidly changing conditions, gives emphasis to reducing production costs and increasing product salability. Representative subjects include new scientific findings relating to quality of present and future products, cost-cutting ways of doing conventional jobs at the plant and efficient replacements for existing production methods.

Chairmen of the participant groups are serving as co-chairmen of the convention. These include: John Bardsley, B. C. Forest Products, Ltd.; P. T. Dickie, Crown Zellerbach Corp.; and Louis Pumphrey, Westminster Paper Co., Ltd. Paul C. Baldwin, executive vice president of Scott Paper Co. will participate as guest speaker. Ed Barnes, Elk Falls Co., Ltd., and C. W. Walseth, and A. Hugh Wickett of Weyerhaeuser Co. (Longview), vice chairmen of the three associations, have arranged the technical sessions.

TOP STUDENTS Geoffrey R. Broughton memorial scholarships of $100 each given by interested companies in the paper industry were presented for the spring semester at Lowell Technological Institute to the junior and senior in paper technology with the highest average for the preceding semester. Left to right are Dean of Students, Richard W. Ivers, Thomas F. Kelly, '62, Norman T. Veillette, '61, both of Lowell, and Dr. Dominick A. Sama, head of the department of chemical engineering and paper technology.

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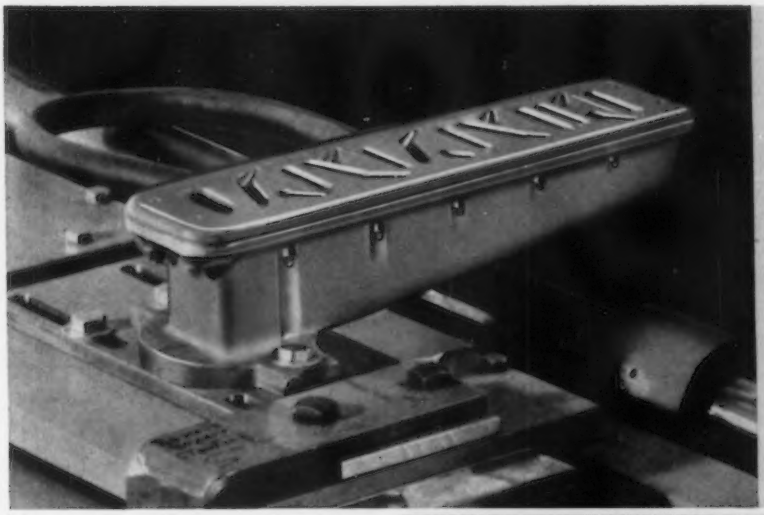
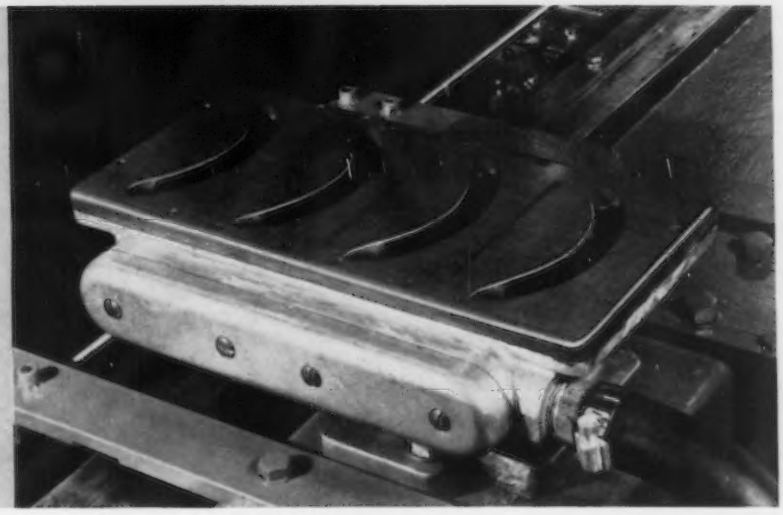


### On your press felts

to keep them continuously clean and open so that the machine never has to shut down or slow down for clogged felts, and so that maximum moisture is removed at the presses where it costs least.

### On your wet felts

to avoid needless cylinder machine shutdowns, assure maintenance of machine speed, avoid crushing, minimize shower volume and lengthen felt life.



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# PAPER PEOPLE

## Great Northern Elects Vice President

John T. Maines of Holden Paper Co. has been elected vice president and manager of woodlands, by Great Northern Paper Co. Also announced is the promotion of David F. Pollard of Millinocket to the position of manager of manufacture.

Mr. Maines has been associated with Great Northern since 1940. A native of Hartford, Conn., he was graduated from the University of Maine in 1940 with a B.S. degree in forestry. He joined Great Northern as a forester, later was a pulpwood buyer, and became general superintendent-purchased wood in 1950. In 1952 he became assistant manager of woodlands, and manager of woodlands in 1958. He makes his office in Bangor.

Mr. Pollard graduated from Tufts College with a B.S. in chemical engineering in 1940. He came with the company in April 1947 and has held positions as technical director, production superintendent at the East Millinocket mill, and has been assistant manager of manufacture since June 1960.

## IP Announces Industrial Relations Appointments

International Paper Co. has appointed Ralph W. Kittle as assistant manager, industrial relations department. Robert B. Kopf has been named manager of industrial relations for the company's Northern Division mills, and J. J. Reid, manager of industrial relations for all converting divisions.

George J. Adams will continue as manager of the company's industrial relations department.

## CWP&P and Wisconsin River Name Power Supt.

Ward J. Anderson has been appointed power superintendent for Consolidated Water Power & Paper Co. and Wisconsin River Power Co. He succeeds the late E. E. Belter.

As power superintendent he will be responsible for the production of hydroelectric and hydromechanical power for Consolidated and Wisconsin River Power Co. and the coordination of steam power production in the company paper mills on the Wisconsin River. He is a native of Scandinavia.

D. B. Wilkinson

## Wilkinson Advances to New Post at Scott Paper

D. B. Wilkinson of BalaCynwyd, Pa., has been named assistant to the executive vice president for production, research and development at Scott Paper Co.

In this post, Mr. Wilkinson will direct special projects, primarily in the area of new products. He has already been assigned responsibility for the production of Scott's new sanitary napkins, "Confidets," and for "Dura-Weve" reinforced paper.

Mr. Wilkinson joined Scott in 1923 as a retail salesman. Following a series of promotions he was named sales manager in Philadelphia and subsequently in Pittsburgh. In 1932 he was selected as assistant to the general sales manager, later becoming assistant advertising manager.

In 1937 he joined the personnel department and shortly thereafter became personnel director. He transferred in 1943 to Scott's wholly owned subsidiary, Marinette Paper Co., as vice president of that company and manager of the Marinette, Wis., plant.

In 1949 he was named manager of the Fort Edward, N. Y., plant and continued to serve as vice president of Marinette Paper Co.

Mr. Wilkinson returned in 1954 to Chester as administrative assistant to the vice president in charge of manufacturing. Since that time his responsibilities increased and his most recent post has been that of eastern regional manager for production.

A graduate of the University of Michigan in 1922, Mr. Wilkinson is a native of Rockford, Mich.

## Swanson Retires from K-C Vice Presidency

Walter H. Swanson, Kimberly-Clark Corp. vice president since 1953, has retired after more than 34 years with the company.

A recognized international authority in pulping processes, Mr. Swanson received the 1958 gold medal for outstanding contributions to the pulp and paper industry from TAPPI, of which he has been a member for many years and its president for two terms.

Mr. Swanson's career and interest in the pulp and paper field began when he studied forestry at the University of Minnesota from which he received his bachelor's degree and at the University of Wisconsin where he received his master's in forest by-products.

Joining Kimberly-Clark as a research man in 1927, Mr. Swanson was named assistant vice president and director of research and development in 1951, and vice president in charge of the Research and Development Center two years later. He represented Kimberly-Clark at the International Congress of Pure and Applied Chemistry at Stockholm, Sweden, in 1954. Mr. Swanson participated in much of the corporation's post-war expansion and particularly with the construction of pulp mills at Terrace Bay, Ont., and Coosa Pines, Ala. He is a director of the Coosa River Newsprint Co., an associate of Kimberly-Clark.

## Columbia Cellulose Names Assistant Technical Supt.

Columbia Cellulose has announced the appointment of C. D. Bown to the position of assistant technical superintendent. Mr. Bown joined the company's Prince Rupert mill, in 1951, as a tester in the cellulose acetate pilot plant and since 1958 has held the position of plant chemist.

In his new post he will direct the activities of the acetate and viscose pilot plants and the main and control laboratories, assist in the formulation and execution of the process engineering program and coordinate mill production with sales. ,

## Otto Retires After 46 Years at CWP&P

Earl F. Otto, director of the Industrial Engineering department for Consolidated Water Power & Paper Co. has retired. Mr. Otto completed 46 years of continuous service with the company on March 31, his last day of work. He began employment with the paper company in 1915 at Wisconsin Rapids as an electrician. He moved to the Mechanical department a few years later where he served as the company's first draftsman and then as storekeeper. He was named superintendent of maintenance for Wisconsin Rapids Division in the twenties, serving in that capacity until 1958 when he was assigned the additional duties of coordinator of inventories. He has been director of the Industrial Engineering department since May 1960.

## Hollingsworth & Vose Elects Officers

Hollingsworth & Vose Co. announces the election of Mark Hollingsworth to the newly created position of executive vice president. Other new elections were Grant Harrington, vice president—sales, and Harold W. Knudson, vice president—research. Aubrey K. Nicholson and Bruce G. Lennox were re-elected president and treasurer, respectively.

Mr. Nicholson has announced his retirement to take effect October 15. At that time, it is contemplated he will be elected chairman of the board in which capacity he will act as a consultant to the company on a part-time basis. At the time of his retirement, it is also contemplated that Mr. Hollingsworth will be elected president and chief executive officer of the company.

Mr. Hollingsworth came with Hollingsworth & Vose in 1946 and was successively a salesman, assistant production manager, plant superintendent and assistant to the president before being elected vice president in 1953. He has been a member of the board of directors since 1950.

Mr. Harrington began his career with Hollingsworth & Vose in 1921 at its West Groton, Mass., plant. In 1943, he was transferred to the sales department in East Walpole, became assistant sales manager in 1946 and was promoted to the position of sales manager in 1949.

Mr. Knudson was with the Naval Research Laboratory from 1943-1945. He joined Hollingsworth & Vose as technical director in 1945 and was appointed director of research in 1960. He obtained his Ph.D. from the University of Wisconsin in 1939. He was awarded the Navy Civilian Meritorious Service Award in 1945.

## Weyerhaeuser Promotes Six At Longview Branch

The Weyerhaeuser Co. has announced six promotions in the Longview branch of its pulp and paperboard division.

T. W. Stewart, superintendent of power for the branch since 1947, was named to a newly created position of maintenance and engineering manager. Mr. Stewart, formerly employed at Weyerhaeuser operations in Everett, will complete 35 years service with the company in May.

William N. Nanney, assistant superintendent of power since 1956, will replace Mr. Stewart. Edward Koeppen, shift engineer, becomes assistant superintendent of power.

Richard H. Cordingly, who joined Weyerhaeuser in 1958 following graduation from the Institute of Paper Chemistry, was promoted to assistant technical director of paper board operations.

Harry A. Brown, assistant to the paper mill superintendent, and Edward Karnoski, paper mill foreman, were named assistant paper mill superintendents.

## OBITUARIES

**G. Elmer Emigh,** who has served as sales engineer in the Southern West Coast area for The Sandy Hill Iron and Brass Works since his retirement from the paper industry in 1954, died on March 4 at his home in South Gate, Calif.

Mr. Emigh held positions as assistant superintendent and superintendent for such companies as International Paper Co., Crown Zellerbach, St. Helens Pulp and Paper Co., Filer Fiber Co., and Pioneer Flintkote Co.

**Richard R. Hill,** 46, manager of sales for the Industrial Division of The Bauer Bros. Co., Springfield, Ohio, died March 19 of a heart attack. He had been with Bauer Bros. 23 years.

**Richard Henrick Laftman,** 74, retired vice president of the National Container Corp. and an honorary vice consul for his native Sweden, died March 28 at his home in Jacksonville, Fla.


Meet Huyck's

"Gerry" Casey

"Gerry" Casey (William G.) has been associated with the textile industry for 39 years, the last nine of which have been with the Huyck Felt Co. at its Rensselaer plant.

"Gerry" is now Huyck's Assistant Mill Superintendent at Rensselaer. He also has been Plant Manager of Kenwood Mills in Cavendish, Vermont and General Manager of Huyck's Fabric Division. As such he has been closely associated with both the design and manufacture of industrial fabrics.

"Gerry's" formal training included attendance at St. Michael's College and Lowell Textile Institute. His experience and "know-how" are reasons why Huyck Performance is High Performance through experience.

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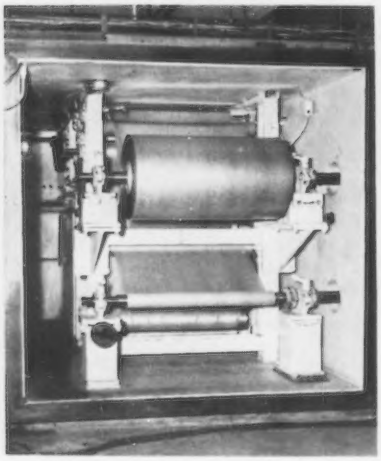


GLASSINE ROLLS are placed in this vacuum chamber and given a microthin coating of pure aluminum.

ALUMINIZED GLASSINE, newest product of Nicolet is inspected by a quality control technician.

## Nicolet Perfects New Aluminized Glassine

A newly perfected process for the manufacture of aluminum coated glassine in continuous mill roll length has been announced by Nicolet Paper Corp., a subsidiary of Milprint, Inc. Milprint is a subsidiary of Philip Morris, Inc.

Nicolet aluminized glassine is expected to be adopted by many packagers presently using regular glassine, according to spokesmen for Nicolet, who predict that the new product will stimulate the use of aluminum in packaging. The reflecting surface of aluminum substantially increases the material's protective value as a light barrier. In addition, it is strong, greaseproof and odor-resistant. Smoothness and luster of the finished product depend upon the grade and type of glassine aluminum coated. Controlled deadfold characteristics are assured by special plasticizers added to the glassine during its manufacture, Nicolet says.

Its protective qualities and attractive appearance make it a logical choice for ice cream bar bags (for which it is already being used commercially), candy bar wraps, labels, potato chip bags, decorative box liners for cookies and confections and limitless other applications in the bakery, dry food and meat industries.

It has been successfully printed by Milprint, using both flexographic and rotogravure processes. Reduced packaging costs promise to be another advantage.

Nicolet's process is such that application of the aluminum takes place in a large vault-like chamber. A high operating vacuum is created and pure aluminum is vaporized at an extremely high temperature, condensing immediately in a permanent bond on the moving glassine. The finished roll is coated on one side only with a microthin layer of alumnium, approximately 3½ millionths of an inch deep .

### Rap-In-Wax Names Two Superintendents

J. R. Kanerva, Rap-In-Wax's Minneapolis plant manager, has just named two new superintendents. They are: William Nelson, who becomes technical superintendent for printing, and Rodger Hefty, who assumes the duties of Minneapolis plant technical superintendent.

Mr. Nelson just joined Rap-In-Wax, having been rotogravure supervisor with Container Corp. of America. Mr. Hefty has been quality control engineer with Rap-In-Wax for some time.

Mr. Kanerva stated that the two newly created positions were a necessary step to accommodate the increase in facilities in Minneapolis.

### Abercrombie Heads Kent Paper Co.

Daniel P. Abercrombie of Darien, Conn., who was associated with the Brightwater Paper Co. of Adams for 21 years prior to 1957, has been elected president of the Kent Paper Co. of New York City.

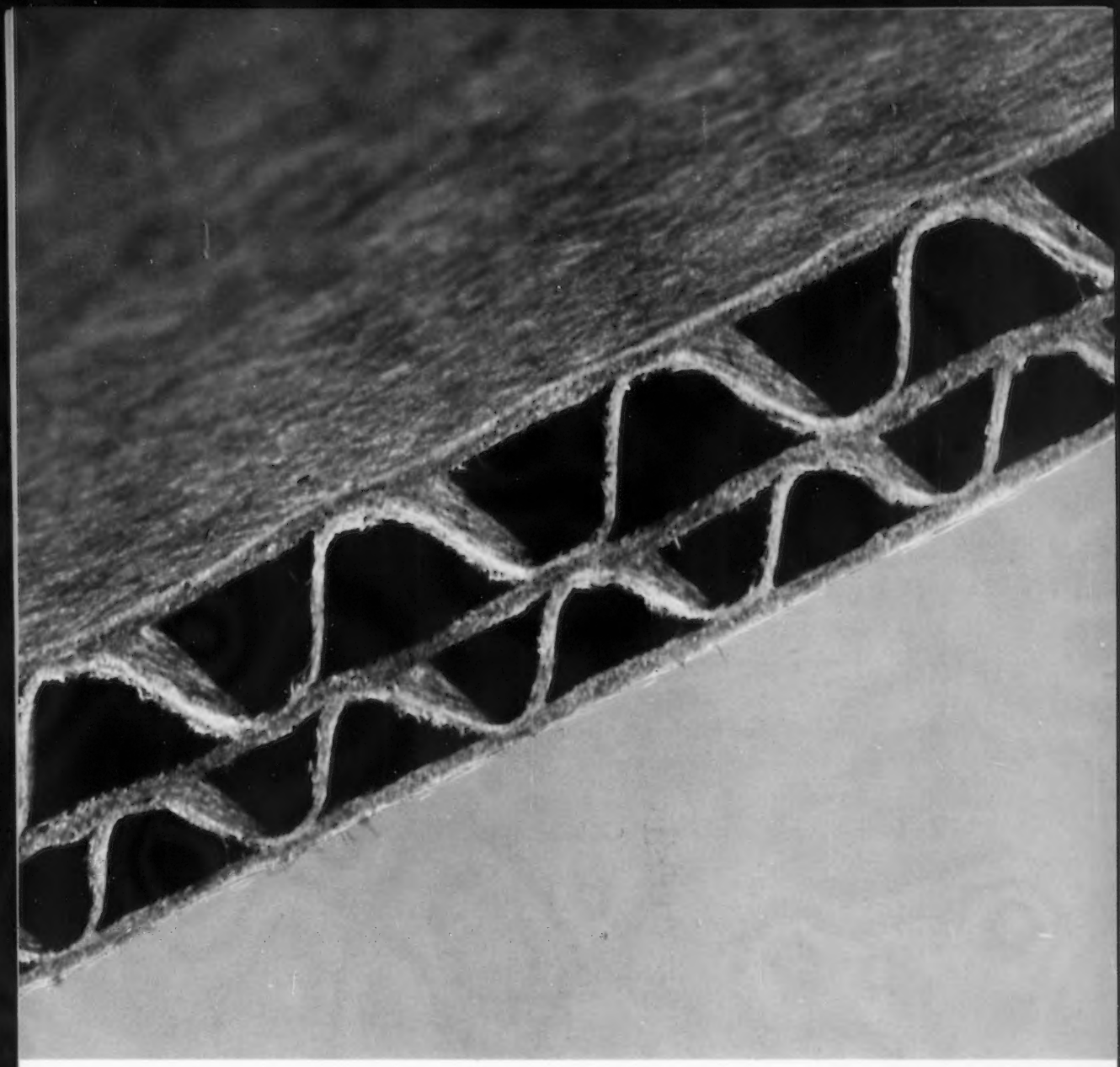
Announcement of his election was made by the Williamhouse Sales Corp. of New York, selling agent for Kent Paper. Mr. Abercrombie left Brightwater four years ago to become vice president of Williamhouse. He will continue to serve in this position and also holds the post of vice president of the Williamhouse of Fine Converting in Scotsdale, Pa., and Los Angeles, Calif.

### Alton Box Board Offers "Elite Flute" Board

A new dimension in corrugated board, bridging the gap between the conventional "plain brown box" and the graphic impact of the multicolor folding carton, has been announced by Alton Box Board., St. Louis, Mo. The new board, trademarked "Elite Flute" by the firm, is reported to combine the strength and rigidity of regular double-face corrugated board with the fine screen printing available previously only on folding box board.

Elite Flute is just one-sixteenth of an inch in thickness, as opposed to B-Flute's one-eighth inch, and has eight flutes to the lineal inch. Because of the closeness of the flutes, the company says, the "washboard" effect of regular corrugated is virtually eliminated. Furthermore, a spokesman said, the close-coupled flutes and the slim profile of the board have enabled Alton's folding carton plants to print it on conventional letterpress equipment and to cut and score it on folding carton cutter-creasers. Corrugated printing and die-cutting equipment also can handle Elite Flute.

Carlos Byassee, vice president and general manager of Alton's Carton Division, disclosed that the board has already been extensively market tested in a wide variety of cartons and display items.



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## Folding Paper Box Ass'n. Elects Officers

D. A. Forsberg, president, Forsberg Paper Box Co., Madison, Wis., has been re-elected president of the Folding Box Ass'n of America, which just concluded its annual meeting at the Drake Hotel, Chicago.

New members of the association's executive committee are W. W. Fitzhugh, Jr., president, New Haven Board & Carton Co., New Haven, Conn., and New York City, and E. B. Wall, vice president, Federal Paper Board Co., Inc., Bogota, N. J.

Continuing as members of the executive committee are Herbert C. Bernard, Shuttleworth Carton Co., New York; Charles Ruble, Sr., Standard Paper Box Co., Los Angeles, Calif.; Leo H. Schoenhofen, Container Corp. of America, Chicago, Ill., and C. B. Stauffacher, Continental Can Co., Inc., New York.

## Cincinnati Industries Elects Officers

William W. Rowe, Jr., formerly assistant to the president of Cincinnati Industries, Inc., was elected president and chief executive officer at the firm's annual directors' meeting.

He succeeds Ford R. Larrabee, who died last month.

In other changes, W. Wallace Rowe, chairman of the board, was elected to the additional posts of chairman of the executive committee and company secretary.

Lewis W. Krehnbrink, vice president of manufacturing, was elected vice president in charge of research and development and treasurer.

Donald W. Alcoke, controller, was elected assistant secretary.

The company manufactures stretchable paper and paperboard under the trade name X-Crepe.

## Mooty Joins CCA Packaging Division

Alfred F. Mooty has joined the Agricultural Packaging Division of Container Corp. of America. He will work with both domestic operations and the Foreign Division, assisting in technical development of corrugated containers for banana shipments. He also will aid in developing other types of produce packaging.

Mr. Mooty formerly was with Fourdrinier Kraft Board Institute, Inc., where he was instrumental in developing corrugated packaging for shipping bananas from the tropics to the United States. He will continue to live in Winter Haven, Fla.


# *This New Nash Vacuum Pump Offers Four Separate Suctions and Vacuums Simultaneously*

The Nash 5308-A has four separate suction inlets, each of which functions independently of the others. This offers the machine operator great flexibility, since these may be used in any desired combination to produce a variety of capacities and vacuums.

Picture below shows simple drive possible and flexibility of piping permitting capacities to exactly fit requirements of different sections of the paper machine.

**NASH**
**ENGINEERING COMPANY**
**SOUTH NORWALK, CONNECTICUT**

GENERAL VIEW of wood yard with the barking drum in foreground.

# Bowaters Has New Ultra-Modern Groundwood Mill in England

## Contains many interesting engineering features in wood unloading, grinder feeding, reject refining, etc.

**R. Reed,**
General Production Supt.,
Bowaters Mersey Division

**The editor visited Bowater's new groundwood mill at Port Ellesmere when it was under construction and was so impressed with the engineering that he arranged to have this article written. Contrary to recent practice in this country, high magazine grinders were installed, adding further fuel to the editor's debate on Groundwood Mill Design with that veteran consulting engineer, A. P. Schnyder. (P. T. J., Dec. 5, 1960.)**

The large newsprint mill of Bowaters United Kingdom Pulp and Paper Mills at Port Ellesmere, England, known as the Mersey Division, in the past depended solely on purchased groundwood and sulphite pulps. When the recent expansion program was being developed it was decided that in addition to two large high speed newsprint machines, a groundwood pulp mill would be built since sufficient domestic spruce was available.

The initial installation consists of four Voith chain grinders with space provided in the building for the future installation of two additional grinders. The plant produces approximately 190 A.D. tons of slush groundwood pulp per day from spruce wood grown in the British Isles. The wood, which is purchased from private and nationally owned forests, is delivered to the mill site by road and rail transport.

### Wood Receipts

The intake section of the wood yard operates on a day shift basis, and an average of 500 gross tons of wood are delivered daily. The wood is scraped from the lorries or rail trucks on to a six chain conveyor by means of a drag scraper crane fitted with special rake head. This method of unloading permits a very fast turn round of the transport. From the six chain conveyor running at 50 feet per minute the wood is carried

to a 42-inch-wide belt conveyor which stretches the full length of the two wood piles. Four plough points are distributed along the length of the belt conveyor, and each of these points can be used to supply the stacker. A fifth plough point is provided so that when the necessity arises wood can be sent direct from the intake to the mill. The mobile stacker arm is 150 feet long, 80 feet high and is equipped with two chains running at 200 feet per minute. The two log piles have a total capacity of 20,000 gross tons of 48" long unbarked logs.

### Wood Recovery

The wood is taken from the piles by a mobile crane fitted with an orange peel type grab, and loaded onto a portable single chain conveyor. The wood is taken to the barking drum from the portable conveyor by an inclined two chain conveyor followed by a 42 inch belt conveyor. The all welded Canadian Ingersoll-Rand barking drum is 45 feet long, 12 feet in diameter and revolves at 4½ r.p.m. Bark is conveyed by a water channel to a rotating drainer before it is removed from the site. (Recently work has commenced on a bark burning boiler which will be capable of raising approximately 1200 lbs. of steam per hour at 80 lbs. per square inch.) Barked wood is carried through the sorting house on a belt conveyor 54 inches wide running at 46 f.p.m. Incompletely barked wood is returned to the drum via a belt conveyor sited under the sorting conveyor. Barked wood is transported from the sorting house to the mill by an inclined two chain conveyor operating at 112 f.p.m.

**UNLOADING LORRIES with the special rake.**

### Automatic Wood Feeding

The wood upon entering the mill building is carried by a 30-inch-wide belt conveyor to a section of driven fluted rolls where the flow is split for the two lines of grinders. After the dividing point, progressively accelerating fluted rolls align the logs so that when they discharge into the hoppers of the slat conveyors, the longitudinal axis of the logs is parallel to the slats. The slat conveyors pull the wood to the grinder magazines, where the flow into the magazines is controlled by pneumatically operated gates.* Surplus wood, which is not required at the grinders, is carried to the end of the slat conveyors and transferred to a belt conveyor which transports the wood to three large bunkers. The bunkers, which are of concrete construction, have a total capacity of 130 gross tons and are capable of maintaining seven hours production should the necessity arise. At the bottom of each bunker there are two hydraulically operated doors which control the flow of wood into a water flume. A recirculating pump propels the wood along the flume to an inclined conveyor which in turn transports the wood to the belt conveyor at the start of the internal system.

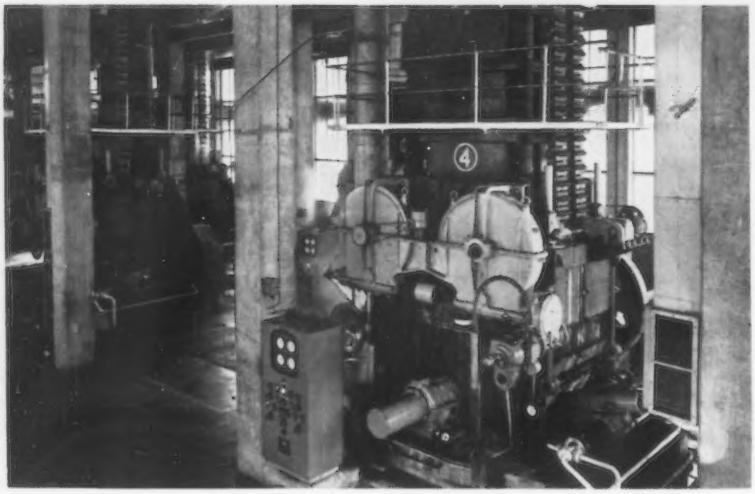
* EDITOR'S NOTE: This automatic system for feeding wood to the grinders is virtually identical with that at the Stora Kopparberg Mill in Kvarnsveden, Sweden and described in detail in Paper Trade Journal, May 4, 1959.

**HYDRAULICALLY operated bunker doors with water flume.**

**THE WOOD FEED splitting for the two grinder lines.**

GENERAL VIEW of the operating floor.

GRINDER loading floor.



The entire wood handling system is electrically interlocked so that in the event of a failure at a conveyor all the previous conveyors are automatically stopped. Wood yard conveyors are started locally, but the internal conveyors are started remotely from a central graphic control panel located between the slat conveyors feeding the grinders. From the control panel the following routes for the wood can be selected: wood yard to grinders and excess to bunkers, wood yard to grinders and direct to bunkers, and bunkers to grinders with the excess back to bunkers.

## Grinders

J. M. Voith of Heidenheim (Brenz) Germany, supplied the four continuous chain magazine grinders. The 72-inch diameter by 54-inch face "Norton" stones are each driven by a 4,000 h.p., 750 r.p.m. motor supplied by British Thomson-Houston Limited. Reduction gear boxes between the motor and grinder have three available gear ratios to give stone shaft speeds of 250, 275 and 290 r.p.m. Each grinder is equipped with two spray pipes, although normally only one is used, operating at 65 lbs. per square inch.

## Screens

The screening equipment consists of three Cowan Reener coarse screens, three Cowan Mark "A" first stage screens and two Cowan Mark "E" second stage screens.

The supply lines to the first and second stage screens are pressure controlled by automatic valves bleeding stock from the two manifolds back to the points of origin.

An automatic valve is also used to control the pressure in the manifold pipe supplying the screen sprays.

## Refining System

Rejects from the coarse screens are fed first of all to a slow running Scott Rietz Pre-Breaker where the size of the rejects is greatly reduced. A Scott Rietz disintegrator, powered by a 150 h.p. motor running at 2975 r.p.m. is then used to break down the rejects before they are blended in a chest with the rejects from the second stage screens. The rejects are then pumped to a thickener, which basically consists of a flat perforated plate which passes chain driven rubber wipers. The thickened material is fed by gravity into a R.G.P. type Raffinator supplied by Asplund Defibrator A.B., which is powered by a 500-h.p. motor. The refined material is rediluted with the water from the thickener and blended with the rejects from the first stage screens. The blended mixture is then screened by the second stage screens, the rejects passing back into the refiner system and the accepted stock to the coarse screen chest.

## Cleaning and Deckering

The entire production is pumped through a three stage Bauer Centri-Cleaner installation before it is thickened.

Five Voith (non-vacuum) deckers are used to thicken the stock before it passes into the 15 tons air dry capacity storage chest.

## Instrumentation

A graphic panel located between the grinders and auxiliary plant is fully equipped with indicators, recorders and controllers for chest levels, screening pressures, temperature control and all motor loads.

An automatic alarm system gives ample warning of abnormal conditions in the system, such as high and low chest levels, and flashing lights on the graphic panel indicate where the trouble exists.

## Building

The three floor building is a reinforced concrete structure and is almost entirely clad with glass. The grinders together with the deckers, screens, refiner and laboratory are located on the first floor. The ground floor is principally used for the chests, pumps, coarse screens, Prebreaker-disintegrator and electrical annex.

*Materials Handling—II*

# Chip Handling and Storage — An Overall View

**Here, two experts discuss the important factors, the problems, the advantages, the disadvantages of various systems used in transporting and storing the paper industry's basic raw material.**

**F. G. Wilson,**
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and
**Curtis E. Green,**
B. L. Montague Co., Greenville, S. C.

This article is limited in scope to handling and storage only; the initial process, production of chips—and subsequent processes such as screening being touched on only in connection with the handling and storage methods required for particular fractions of the chips produced.

Wood chips are not a difficult material to handle as compared with, for instance, pulpwood logs. They are small in size, the nominal range of size being ordinarily one-half inch to three quarters of an inch, this being the dimension at right angles to the path of the knife of the chipper. The other chip dimension is generally greater, and in the case of a poor chipping operation, cards may be produced considerably larger than a man's hand. Normally, however, chips will run less than 5 sq. in. in area as produced, and acceptable chips will usually be not more than half of this size. Wood chips are friable and break quite easily along the lines of the wood grains and also present several rough surfaces to each other and to handling and storage equipment; therefore, do not slide very readily, particularly if under any pressure. Chips piled in storage have a great tendency to bridge, yet because of the wide range of sizes spillage of chips from conveying equipment is a problem. Because of the fact that any mechanical damage to chips after production as well as in the production process tends to weaken fibers and hence decrease pulp strength, certain handling methods are ruled out and these include blowing systems wherein chips pass directly through the blowing fan. The pneumatic handling of chips is covered in detail elsewhere in the article.

Chips will vary in weight depending on species, chip size, and moisture content, ranging from twelve to twenty-five pounds per cubic foot generally. Compaction of course affects density as well as the factors mentioned above. The degree of compaction in storage will depend upon the method of placement, the presence of vibration after placement and the length of storage.

Following production of chips in the chipper, they are for most pulp grades immediately screened in order to remove oversize and undersize particles, the latter normally being called sawdust, or fines. With few exceptions, fines are generally burned in the bark boiler, and oversize chips are either further processed in a rechipper or fed back to the feed of the pulpwood chipper. In the discussion following, it will be assumed that only the accepts from the chip screen are being considered, or that no screening is involved. Handling and storage methods and equipment are the same for the two circumstances.

In order to properly feed and prevent overloading the screens from the chippers, surge bins with star type feeders are generally located ahead of the screens.

## Belt Conveyor Popular

A considerable variety of conveying equipment has been and is being used to transport wood chips at the mill, and neglecting pneumatic conveying which is covered separately, the one presently most popular is the belt conveyor. While not as low in first cost as some other methods described below particularly where great vertical lifts are involved, the belt conveyor is preferred for a number of reasons, the most prominent of which are:

1. Reliability
2. Low maintenance
3. Low horsepower requirement
4. Minimum damage to chips
5. Least likelihood of introduction of tramp metal

The belt conveyors used to transport wood chips will range in width from about 16 inches to as wide as 60 inches, but most will fall within the 24 inch to 42 inch range. Lengths will run from as little as 20 feet to as much as 1000 feet, and vertical lifts may be as great as 80 feet or more. Horsepower requirement covers an equally wide range, varying between as little as 3 h.p. to as much as 75 h.p.

Prefabricated belt conveying units for wood chips are in the minority. Most belt conveyors in wood rooms are custom designed and built for the specific purpose. Carrying idlers usually are 20 degree troughing with five foot center distance, the return idlers being straight on about ten foot centers. Belts are chosen for resistance to the volatile substances in the wood, this being particularly important when belts are used on resinous southern pine. Belts will range from three-ply, 28-oz. duck upward depending on the service, and covers usually are ⅛-inch top 1/32-inch bottom. Surfaces are usually smooth since it has been found that rough top belts rapidly fill with resinous material and fines. Belt speeds range from 250 feet per minute to as

much as 600 feet per minute, though most mills prefer to hold chip belt speeds under 500 feet per minute.

### Impaction at High Velocity

Beginning at the first point in the system which is the discharge from the chipper, some of these special requirements for chip belt conveyors are:

For the belt carrying chips away from the chipper, consideration must be given to the effect of impaction of chips at high velocity against the belt as they come from the chipper. This effect may be minimized by the use of deflection plates immediately under the chipper discharge. In the case of a blowing type chipper, discharging directly to screen feed hoppers, no conveyor follows immediately after the chipper therefore there is no such problem. In addition to this special consideration, the belt accepting chips from the chipper must have a capacity considerably in excess of the average chipping rate since momentary peak production rates of large modern chippers can exceed 100 cords per hour. Lack of capacity in this belt will result in plugging under the chipper and require shut-down for clean up.

If space is not at a premium, the belt accepting chips from the chipper may also be used to elevate them to a point sufficiently high that they may be fed by gravity to the chip screens. This will require quite a long belt and because of the high capacity therefore quite an expensive one. For this reason and the more important usual considerations of space, a belt bucket elevator is quite often used following a short belt under the chipper to elevate chips to the screen feed point. This elevator must, in order to avoid plugging in the boot, have a capacity slightly in excess of the peak loading of the belt feeding it. Where screens are involved, the elevator may discharge directly to screen feed surge hoppers or, if there are more than three or four screens, a spreading conveyor may be required. This is a special application, and a belt is seldom the economical answer; therefore, this will be discussed under another category. Following the chip screens, belts are normally used to carry accepted chips to storage, oversize chips to the rechipper or back to the pulpwood chipper, and fines to the nearest bark belt or to the bark storage pile.

### Screen Blinding a Problem

Although normally loaded with only a fraction of the total chips handled by the screen, the belt for oversize chips must be sized with due consideration for the fact that screens may be, at times, completely blinded particularly when operating with dull chipper knives and, in this event, the total chip production may spill onto the oversize belt. The fines belt will never be required to handle more than a very small fraction of the total chip production and is usually not more than eighteen inches wide. Length will vary with the layout.

The load for the accepted chips belt will be reduced by the amount of the normal oversize and fines production, but more important because of the small storage ahead of the screens, the chip flow has been smoothed out to an average rate, therefore the belt that takes accepted chips from the screen seldom has to be more than 36 inches in width except for a very large installation. If this belt is to take chips directly to storage, it must act as an elevator to a height of as much as 80 feet, therefore, will be quite long, seldom less than 500 feet.

If more than one storage bin or silo is used, an additional conveyor will be required following the belt from the screen and this conveyor may be a belt or another type to be described hereafter. If a belt is used, plows or a tripper will be required to discharge the belt to multiple storage points. The use of plows is much lower in first cost than the moving tripper; the latter results in less spillage, less belt damage and more reliable operation. The tripper positioning may be accomplished by manual or automatic controls, either at the belt gallery or a remote location and the tripper may be belt-powered or electric-motor powered. The latter is a better and more modern method. Trippers may be single or double discharge depending on capacity of the system and arrangement of the conveyor in relation to the storage below.

A less common method of utilizing a belt to feed more than one storage unit is the shuttle belt in which the entire belt conveyor feeding the storage is mounted on rails to move so that the head or, in the case of a reversing shuttle, the head or tail can be positioned over any of the storage feed openings while always maintaining some point on the belt under the discharge of the belt carrying chips from the wood room. The shuttle belt is generally favored when discharging into long open storage.

### Factors in Belt Sizing

The size of the belt or belts carrychips from storage will depend on a number of factors among which are:

1. If batch digesters, the number being served.
2. The size of individual digesters.
3. The digester cycle time.
4. The presence or absence of any additional storage immediately ahead of the individual digester or a group of digesters.

Depending on the above factors, the belt from storage may vary between 36 inches and 60 inches or, in a few cases, even 72 inches in width for feeding batch type digesters. If continuous digesters are used, the belt capacity becomes essentially the average production capacity of the digesters; therefore, is seldom more than 36 inches in width. If the belt from storage is used to elevate to the digester feed point, a total center-to-center vertical height of as much as 80 ft. may be involved; therefore, this belt like the one going to storage may be quite long. It is, therefore, generally the most expensive belt conveyor in the system.

If batch digesters are used, a second conveyor over digesters or over the digester loading bin, if such bins are used, is normally used in conjunction with plows or more generally today, a tripper to enable the operators to alternate the discharge from digester to digester or bin to bin as required. This operation may be made automatic. If digester loading bins of one to one and one-half digester charge capacity are used ahead of each digester and cycle time permits, the belts to the digester room may be much smaller than is the case where the belt feeds the digester directly. Modern practice has been away from the use of such secondary storage bins because the additional building cost and the cost of the bins more than offset the dif-

***A special requirement of long elevating conveyors sometimes overlooked to the considerable embarrassment of the owners is the backstop or hold back at the head or drive end of the conveyor.***

ference in conveyor costs. Where a group of digesters may be fed from a single such bin, the bin is often the economical answer.

### Sometimes Overlooked

A special requirement of long elevating conveyors sometimes overlooked to the considerable embarrassment of the owners is the backstop or hold back at the head or drive end of the conveyor. Upon breaking the power supply to the driving motor of such a conveyor, the tendency is for the conveyor to run backwards if loaded, and a long belt with considerable elevation will attain great speed in the reverse direction and empty itself at the foot. Devices to prevent this may be any one of a number of non-reversing clutches, a very reliable type using a series of rollers and a spiral housing. An automatic motor brake may be used for this purpose. It is best, if possible, to apply the holdback device directly to the head shaft of the conveyor so that any breakage in the drive train will not affect it.

All belts handling chips should have a belt cleaner or scraper of some type. No truly satisfactory belt cleaner has been developed. Rubber-edged belt scrapers, gravity loaded, scraping against the belt immediately after the head pulley on the return run are most generally used. Metal blade scrapers of various designs have been tried and work satisfactorily for awhile, but upon becoming worn may damage the belt and, in some cases, this damage is quite serious. Brushes work fairly well, but stationary brushes become clogged and wear rapidly as do rotating brushes which are quite expensive. Piano wire scrapers have been used in some applications.

There is some disagreement among users as to whether chip belts should be decked over beneath the carrying run of the belt. The deck adds rigidity to the conveyor frame and prevents spillage of chips to the ground or to the floor of galleries or most important—to the inside of the belt on the return run. On the other hand, lack of proper routine clean up permits chips to build up on the deck to the point where the carrying idlers may be running in a bed of chips causing excessive wear on idlers and belts. The choice is a matter of housekeeping and individual preference.

### Cost of Belt Conveyors

Belt conveyors for handling chips can be built as cheaply or as expensively as the user desires, but as in all things he gets what he pays for and an attempt to lower capital expenditure too much usually results in excessive maintenance costs and early replacements. This is especially true of the moving parts of the conveyor such as head works, tail works and idlers, and the belts themselves. An average installed cost for all the chip belts in a modern mill of ordinary capacity is about $125 per foot. This covers a range of costs for different belts from about $35 per ft. to $200 per ft. These figures include all structure, foundations, walkways, etc. and the driving motors wired up with controls. The use of stock prebuilt conveyors may reduce these cost figures somewhat and, on the other hand, the use of oversize belts and extra quality belts, two-side walkways and other dress-up features can add considerably to the cost. The use of open galleries or simple structural bridges with a single walkway, versus closed galleries, will depend on climate and will cause a considerable variation in cost.

***Belt conveyors for handling chips can be built as cheaply or as expensively as the user desires, but he gets what he pays for and an attempt to lower capital expenditure too much usually results in excessive maintenance costs and early replacements.***

### Other Conveyors

The principal other mechanical means of conveying chips are:

1. *The screw conveyor.* This conveyor has the advantage of readily adapting itself to multiple discharge points, is reasonably reliable in operation, and tends to smooth out loading of subsequent conveyors in the system. It has a definite capacity limit and cannot be overloaded, however, and can cause some mechanical damage to chips. It is used sometimes as a first conveyor following the chipper, particularly where a belt bucket elevator follows in order to obtain uniform feed and is also sometimes used to feed multiple surge hoppers ahead of screens or, in some cases, multiple storage feed points.

2. *Drag chain conveyors.* This method of conveying chips while quite common in the past, and still in use in many places, particularly to move chips from storage is becoming less popular because of high maintenance, the availability of better storage discharge systems and a tendency to cause mechanical damage to chips.

3. *Chain and flight conveyors.* This system of conveying which in its most popular form consists of two chains with steel plate flights mounted between has characteristics similar to the screw conveyor in that it has a definite capacity limit, tends to smooth out flow (act as a feeder) and is adaptable to multiple discharge unloading, but it also is usually a high maintenance item. It is relatively inexpensive, and is therefore sometimes used in place of the belt and tripper to feed a group of storage bins or silos. It is very important in the construction of this type of conveyor to use absolutely positive fastenings at all points because of vibration. Ordinary lock washers and nuts are entirely inadequate. All connections should be either riveted, welded, or fastened with bolts castellated and cottered nuts. This requirement is particularly true of the attachment of the plate flights to the chain.

4. *Apron conveyor.* This conveyor has been used in the past and is still used in a few instances as a feeder from storage. It is fairly satisfactory, but is being replaced on new installations particularly by the rotating plate feeder covered below.

5. *Rotating plate feeder.* This method of removing chips from storage is the most popular at present because of its simplicity, ruggedness, and ability to feed chips uniformly from storage. It is manufactured by all the principal conveyor companies in the United States and abroad and has become almost a standard item with most of them. The two chief hazards in installation of this type of feeder are:

a. Failure to recognize the intensity of the impact which may occur when bridged chips fall in the storage bin.

b. Failure to recognize the high starting torque required to turn the feeder under a full load of stored chips, particularly where these chips have not been disturbed for a long period.

6. *Bulk Flow and Redler Conveyors.* The above are trade names for a type of conveyor which utilizes completely enclosed chained and flight conveying media in which the run and return are separate and the chains are guided so that long radius turns may be made without the use of sprockets. This conveying method is a good metering device on a volumetric basis and is very convenient where a combination of horizontal and vertical conveying is desired in the same unit. It has the disadvantage of relatively high friction which has resulted in excessive wear in some installations.

7. *Vibrating feeders and conveyors.* This type of conveyor which uses a controlled oscillation of a conveying pan to move chips short distances has limited application but is useful for obtaining a uniform feed rate for short distances. Power consumption is low.

Although other means of conveying chips mechanically have been and are being used they are so rare in comparison with those described above that it is not believed worth while to mention them here.

## Chip Storage

Chip storage is an important item in the wood room and is required for both protection of the operation of the digesters and for protection against shutdown of the chip production. In addition, adequate chip storage permits operation of the chip production less than 24 hours per day and, in many cases, only eight hours per day. In a few instances, housed chip storage is sufficient to permit shutdown of chip production facilities over the week end. This is not common, however.

Rectangular chip storage facilities are generally referred to as bins and cylindrical chip storage facilities of whatever construction generally are referred to as silos. Rectangular bins are losing popularity mainly because of their much higher construction costs than the cylindrical silos. They do have the advantage of being adaptable to a single discharge conveyor, such as a drag screw or flight conveyor for a relatively large single storage unit or a group of such units whereas cylindrical silos require a separate discharge mechanism for each unit. Both the modern silo design and the modern rectangular bin design involve normally the support of the stored chips on the structure. A few low cylindrical or rectangular storage bins have been installed in which the weight of the stored material rests on a floor supported by the ground. This floor is usually hopper shaped and chips are removed by one or more discharge conveyors. The reason why this method has not become more popular is not clear since there is a definite saving in construction costs of the storage facilities. Part of the answer may lie in its lack of adaptability to the popular disc feeder discharge method which works best on the cylindrical silo having a diameter 40 ft. or less.

Silo construction varies but the two most popular are the steel shell with some type of protective coating on the exterior only and the steel reinforced tile silo. The former may have a slight advantage in installed cost over the latter, but at least in warmer climates has considerably higher maintenance. Tile has the advantage of somewhat better appearance. Other materials which have been used include the precast concrete stave with steel hoop reinforcement, the slip form concrete silo, the poured in place concrete silo or rectangular bin, and in a few instances wood silos. Whatever the material of the silo wall, a steel cone bottom is normally used just above the circular plate feeder.

In addition to the storage facilities described above, other types have been tried and are in use including the suspended parabolic bin generally used over digesters and depending on the digester building for support; the rectangular bin having an inverted V-bottom with traveling screw feeder on each side and the V-bottom rectangular bin with a single traveling screw feeder. All of these, if all construction costs are considered, are considerably more expensive than the plain cylindrical silo, but for reasons other than costs some mills continue to use one or the other.

## Silo Capacity

Storage capacities vary depending on the mill requirement. A popular size silo unit is between 32 and 40 ft. in diameter and between 60 and 70 ft. high from ground to top slab. To assist in removal of chips, vibrators are normally installed on the steel cone bottom. These may be electrical impulse vibrators or mechanical, the former being more popular.

Some indication of the level of chips in the silo is important. Various devices are used including the pressure diaphragm, rotating paddle (for high level indication only), and the capacitance probe. In a few instances a man is used to watch the level in a group of silos and inform the wood room and the digester of the condition of each storage unit.

Where more than one species of wood is chipped and segregated, a portion of a group of silos will be used exclusively for one species and where a group of silos is so divided for two species, two discharge conveyor systems are required. If the two types of chips are produced in the wood room in separate production units, separate conveyor systems to the silos will also be required.

## Operation of the System

Up to this point, this description has covered the nature of the equipment used only with no mention of the actual operation. The train of conveyors and feeding units involved in a chip handling system is more or less sequential and the operation of any unit depends on the operation of prior units in the system and affects the operation of subsequent units. Start up and shut down sequence is important, and is normally controlled by electrical interlocks so that the end unit of the system starts first with prior units, starting in proper sequence, and in shutdown the first unit in the system shuts down first, subsequent units following in order. Thus, the loading of an inoperative unit is avoided, and the premature shutdown of a unit is prevented. In addition to the automatic sequence operation for start up and shutdown, control buttons are normally placed at each unit for maintenance purposes. From the beginning to the end of the system it is good practice to have a slight increase in both speed and capacity for each following unit to insure proper loading and avoid plugging the system. The design of discharge and loading chutes is important for all types of conveyors and elevators and should be carefully thought out for each operation.

***The two principal problems in storage and handling of chips are respectively, bridging in storage, and spillage in transport.***

***The flexibility of the pneumatic air system makes it easily adaptable to the stock piling of large quantities of chips in outside storage.***

In addition to the more common devices described above, there are certain patented special storage unloading devices on the market, the two principal ones being a straight line traveling screw and a radial screw rotating in the circular path. The former is used in rectangular bin designs and the latter in modified cylindrical silo designs. This latter system utilizes a driving head for the screw which is housed outside of the silo wall, requiring that the silo wall be supported independently of the silo floor to permit passage of the driving mechanism under the wall. Both of these systems are convenient and reliable, but more expensive than the more popular plate feeder.

### Conveying Problems

There are two problems involved in the conveying of chips by mechanical means which, while not actually a part of the conveying operation, are necessary auxiliaries. The first of these is the elimination of tramp metal before the chips arrive at the digester. This is never 100 per cent effective, but the attempt must be made and what is achieved is accomplished in the case of ferrous metals by the use of fixed electromagnets and magnetic head pulleys, either electromagnetic or of the permanent magnet type, and for non-ferrous metals by means of metal detectors installed at strategic points in the conveyor runs. The magnetic devices actually remove the ferrous magnetic materials from the flow of chips whereas the metal detectors are used to warn of the presence of metal and, in some cases, to shut down the conveyor. The other problem is measurement of the flow of chips. While this is done volumetrically for some particular operations, the common method is to weigh the chips in motion generally on a conveyor belt, by means of a lever type scale or one of the newer load cell types. Either of these can be adapted to both indicating and recording mechanism and even to actuate feed rate control devices, such as the plows on rotating chip feeders.

### Bridging and Spillage

As mentioned briefly above, the two principal problems in storage and handling of chips are respectively, bridging in storage, and spillage in transport. Bridging is the result of the low density and high friction characteristics of wood chips and spillage is partially the result of the low density, but more generally the result of poor loading of conveyors or undercapacity of these units. Bridging can be minimized by a constant turnover of storage and spillage can be reduced by design of conveyors for adequate capacities and by careful design of loading points. Plugging does occur in chip conveyor systems, but in the mechanical types most popular is not nearly the problem that this malfunction is in the handling of pulpwood logs. In general, wood chips are relatively easy to handle and store and this material adapts itself to a great variety of conveying and storing equipment.

Since chips are a combustible material fire underwriters require sprinkling of galleries and storage, and this equipment should not be overlooked in any estimate of the cost of chip storage and conveying installations.

### Chips from Outside Sources

The use of chips from sources outside the mill has increased rapidly in the past few years. It is estimated that purchased chips may represent eleven to twelve per cent of the total chips used in 1960. Hand in hand with this condition is the rapid increase and improvement of facilities for handling these chips. Basically, three qualities are desired in purchased chips—(1) clean, high quality chips, (2) uniform size, (3) moisture content averaging 50 per cent.

Chips are received at the pulp mill yard in various types of carriers. The most common of these carriers are box cars, hopper cars, truck trailers, and barges.

### Railroad Cars

Some mills receive rail shipment of chips in box cars only. In some remote instances, powered scoops have been used to unload chips from box cars. This is a very slow process. Also, vacuum type air conveying systems have been used to unload box cars. This has not proved to be very satisfactory. At this writing, front end wheel loaders are the most popular equipment for this operation. The wheel loaders scoop up chips in the car, then back out or turn and dump their load into a chip hopper.

Standard hopper bottom cars which are used for transporting chips have been remodeled—generally by increasing the height of the sides for a greater payload. These cars discharge chips through the hopper bottom openings. Almost without exception the use of a shaker is required on these cars to dislodge the packed chips. Once the chips start flowing, generally they will continue to flow out of these cars, if the chips can be carried away at a rate fast enough to prevent piling up under the openings in the car.

Open top, side discharge type cars are also used. The earlier types are found on the West Coast. The lower portion of the sides of these cars are raised for discharging the chips. A device consisting of two strands of cable and a bar flight is considered part of the equipment of the car and remains in the car at all times. The ends of these cables are attached to a driving device which oscillates the bar back and forth across the bottom of the car to push and rake out the chips.

A more recent version of this type of car is found in the Southeastern area of the United States. This is an open type car with extra height on the side walls. The lower portion of the side walls can be raised to permit an unloading unit to remove chips from the car. This unloading unit was designed by the railroad company which also designed this side unloading car. The unit travels on a beam along the unloading track. A swivelling boom on the unloader angles through the chips and rakes them into a pit beneath the track.

Another new innovation of cars for chip traffic makes use of the end-discharge principle. This type of car opens on one end only. The cars are unloaded by a hydraulic-lift dumper that tilts to 58° by elevating one end. This discharges the chips out of the rear of the car, when the swinging top-hinged end door has been opened. The unloading platform is elevated by means of two, four-sectioned telescoping hydraulic lift cylinders.

### Truck Trailers

Chips delivered to the mill in open and closed truck-trailers are discharged from these truck-trailers by inclining the trailer to an angle which will permit the chips to flow

and then discharge to a collecting hopper. Two basic types of lifts are used for this purpose, one being the hydraulic lift, and the other being the overhead mechanical lift. Some installations of both types are designed to handle the tractor and trailer instead of the trailer only. Each type of lift has definite advantages. The hydraulic truck dumper has no overhead structure. On the other hand, the overhead mechanical lift can easily be incorporated into an overhead structure which is necessary in some chip unloading installations involving the use of car shakers and overhead return runs of the conveyor chain.

### Barges

Barges are also used to transport chips into pulp mill yard facilities. Chips are unloaded from barges by means of cranes with buckets or vacuum type air conveying systems.

***Another method of handling chips into the mill which may come into realization soon is the pumping of chips through pipe lines.***

One West Coast operation uses a hydraulic bucket (7 yards capacity) for unloading barges. Barges are cleaned up with a payloader.

Experiments are being made in some areas for the purpose of considering chip carriers which will be spherical in shape. The carriers could be made of plastic or rubber or other lightweight materials and floated down rivers to pulp mills. In the event that it will be possible to develop a practical carrier of this type the size will be limited by the fact that the empty carriers will have to be dismantled and returned to the source of chip supply.

### Chip Unloading Systems

Most facilities for receiving purchased chips at pulp mills are designed to receive chips from rail cars and trucks. Chips are discharged from hopper bottom cars or side discharge cars to a collecting hopper. Newest of these installations have the hopper long enough to take the discharge from a full length car without moving the car. Earlier installations have shorter hoppers, thus requiring that the cars be moved at least once during the unloading operation.

Most collecting hoppers have drag feeders to collect and feed the chips to another conveyor at a specified rate. These feeders generally consist of two strands of heavy duty chain with cross bars spaced on about two foot centers. This collecting-conveyor-feeder averages three to four feet overall width and drags underneath the chips in the hopper. Other installations use multiple chain conveyor-feeders for the same purpose. Also screw feeders are used for this purpose.

Collecting hopper sizes are limited on the basis of capacity required. Other limiting factors are cost and undesirability of excessive pit depth in certain areas of the country.

Chips are fed from these collecting hoppers to belt conveyor systems or to air conveying systems. The belt conveying systems have been described in this paper previously.

In the case of chips being discharged to an air system, the chips are fed through a feeder which meters the chips through the air system at a given rate. Chips are then conveyed by the air system to a screen room or direct to silos or outside storage. In order to obtain the maximum efficiency of a system like this, some installations have a control mechanism to schedule the rate of flow of chips. This is done by means of a connection between the drive on the blower of the air system and the drive on the drag flight or collecting conveyor under the track hopper. The load on the motor of the air system is lessened when the system is not operating at full capacity and this signals the drive on the conveyor under the track hopper to increase the speed and thus increase the flow of chips in the air system. The same procedure results when the air system becomes overloaded. Chips may also be blown directly to digesters. Compaction is of use in charging digesters. Indications are that by charging a digester with high pressure pneumatics, a larger quantity of chips could be compacted into the digesters.

### Outside Chip Storage

Outside storage of chips has been used on the West Coast for several years now. Some mills have their entire wood supply in outside chip storage. Outside chip storage piles have proven to be most successful. Some chips have been stored for three years or longer. The popularity of this storage media is increasing as mills learn how to cope with factors of degradation, preparation of storage areas, and best method of putting chips into storage and recovery systems.

Chips are stored outdoors on various types of surfaces. Some mills use prepared surfaces, black topped on concrete. Others store chips on sand surfaces. Some mills do not prepare the storage surface and allow chips to become embedded in the ground and form their own surface.

It has been found that there is little change in temperature in chip storage piles, except for a slight increase in 4 to 5 feet from the outer surface of the pile. Time in storage apparently has no affect on the temperature of the chips.

Some mills indicate that pulp quality is better when using stored chips but go direct to digesters when possible to save handling costs. Other mills express no preference of fresh versus stored chips. Some mills cook all ages of chips together.

Various comments have been made concerning deterioration of wood chips in outdoor storage. One mill on the West Coast indicates that degradation is accelerated near the bottom of their pile due to a drainage problem caused by excessive rain and snow. Another mill indicates no loss in yield and no problem in foaming except Idaho Pine. This same mill indicates that "popcorn balls" appear in hemlock chips after better than three years of storage. The "popcorn balls" form as a result of some mold collecting. It is interesting to note that the chips immediately adjacent to these "popcorn balls" will be in perfect condition.

Outdoor storage results in some discoloration of chips but with little or no effect on pulp. Contamination of chips is sometimes a problem—such as stocks in the vicinity, sand in the area, and black top from a storage area.

Another West Coast mill indicates that no rotting of chips has been found and that no changes in pulp yield from old chips have been experienced. Rotation of the pile has not been rigidly programmed. It has not been found necessary to rotate the pile to prevent loss of chip quality. Rotation has been because of pitch and foam. This mill feels, that when digested, aged chips from the pile show less foaming tendencies on the washers and knotters—and that pitch deposits on equipment seem to

be reduced when they revert to use of older chips rather than use of chips from rail cars.

### Pneumatic Conveying

High pressure, pneumatic conveying has been responsible for low cost methods of handling and reclaiming chips for outside storage. High pressure pneumatic conveying systems operate in the pressure range of 3 to 8 p.s.i. and are classified as high pressure systems due to the comparison of blower-fan systems which operate at pressure of ½ p.s.i. and under.

Pneumatic air systems in excess of 5,000 ft. in length handling chips are operating most satisfactorily today. Basically these systems consist of a positive pressure motor-driven blower connected to piping which connects the blower to chip feeder. Usually, an intake silencer is furnished for the blower. The wood chip feeder is of the revolving type and is motor driven. Chips are dropped by the feeder into conveying lines consisting of spiral welded pipe and rectangular section turns and standard pipe turns. At the terminal end of the system, the chips may be discharged to atmosphere, in the case of outside storage, or through a single stage cyclone receiver if discharging into chip storage bins.

The flexibility of the pneumatic air system makes it easily adaptable to the stock piling of large quantities of chips in outside storage.

Most outside chip storage systems use bladed tractors to level off the storage piles and to reclaim chips from the storage pile to a feeder station. The rotary type plate feeder is very popular for reclaiming chips in outside storage systems. One of the newer mills in the Northwest section employs the use of a traveling screw feeder which discharges chips from a shelf underneath the storage pile to a belt conveyor alongside the shelf. Also pneumatic air systems handle chips from the stationary reclaiming feeder such as the rotary plate feeder mentioned above.

### Fire Protection

There appears to be considerable variation of opinion concerning fire protection for outdoor chip storage. Some mills have no protection, others have protection in various degrees. Although one mill has never had a fire, they have fire protection around and on top of the pile because they cannot stand carbon in pulp.

The most economical arrangement for outdoor chip storage is to use an area as concentrated as possible—that is to pile chips as high as the area and equipment used will permit. This cuts down to an absolute minimum the amount of handling in and out of storage.

Much interest in parts of the country other than the West is now being shown in outside chip storage, particularly in the South. Several mills are stockpiling chips and are studying deterioration and handling costs. Continued study should be made to determine the best combination of handling chips into storage and reclaiming from storage. There is the definite possibility that an automatic outdoor chip storage system can be realized. Such a system may possibly consist of a long rectangular pile with an overhead discharge system and with an automatic drag line reclaim feeding a collecting conveyor.

### Pumping Chips

Another method of handling chips into the mill which may come into realization soon is the pumping of chips through pipe lines. It may be considered feasible to pump the chips directly from chipping stations in the woods into the mills. Engineers are considering partial processing of chips in lines which will be pumped into the mills.

A forerunner of the idea of pumping chips to mills is the already proven systems of outside pulp storage. One company operates a system whereby pulp is loaded into ships at a pulp mill and shipped to another destination. These ships are docked at the destination and the pulp is sluiced into pumps on the ship and pumped into storage tanks on the unloading dock. Another mill makes nodular pulp. The pulp is loaded into trailers by means of conveyors. This pulp is shipped to another plant where the pulp is simply washed out of the trailers and transported by conveyor to a re-pulper, it is then pumped into the machine room of this plant.

Some consideration has been given to the underwater storage of chips; however, the writers do not know of any installations of this type or any tests being made along this line.


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**Using jet cooking systems for both wet end and size press . . .**

# Monadnock Leads Way In Automatic Starch Cooking

**R. J. Meador and M. L. Cushing,**
A. E. Staley Manufacturing Co.,
Decatur, Ill.

To gain better control over starch preparation and to produce a more uniform cooked paste, Monadnock Paper Mills, Inc., of Bennington, N. H., has installed Staley automatic jet cooking systems to cook continuously starch for both size-press and wet-end addition, thereby becoming one of the first mills in the United States to use this method for the preparation of all its starch.

This is the most recent of many "firsts" accumulated by Monadnock through the years since it began its tradition-steeped history nearly a century and a half ago, when it became the first mill in America to make paper from flax. Nowadays, this progressive, nonintegrated paper mill, with a capacity of 65 tons per day, specializes in the manufacture of uncoated offset, book, converting and specialty papers. It is particularly well-known for its quality publishers book grades.

The installation of jet cookers was only one of the steps in Monadnock's half-million-dollar modernization program which extended from new E. D. Jones refiners and jordans to Langston slitters and winders for both its fourdrinier machines. Other major improvements included new stock chest agitators, headboxes, suction couch rolls, a Sandy Hill roll slitter for broke handling, an automatic Southworth straddle table system, and Babcock and Wilcox automatic steam boilers. In addition, research and development and quality control laboratories were enlarged and fully equipped.

## Starch Prep Problems

Because a basic object of the modernization program was increased efficiency, the elimination of batch cooking of starch was given high priority. Particularly at the size press, the variety of paper grades in manufacture necessitated changes in starch concentration, which in turn required numerous tanks and created many problems. For example, in changing formulations, starch losses were considerable when tanks containing several hundred pounds of starch were drained to the sewer.

Batches of starch paste were prepared in relatively large volumes to save on labor, and these batches frequently were stored for some time. The result was occasional bacterial spoilage, as well as changes in viscosity and other problems related to starch retrogradation.

The Monadnock technical staff felt that these problems, in addition to the inaccuracies inherent in manual starch preparation, might be solved by a reliable system for cooking starch automatically.

Because the A. E. Staley Manufacturing Co. pioneered in the development of continuous starch-cooking equipment nearly ten years ago, Monadnock began a program of experimentation with this company. An automatic jet cooking system was installed experimentally at the wet end of one machine, with the plan that others would be installed at the size presses if the trials proved successful.

These preliminary tests demonstrated the benefits of the system. Greater starch uniformity improved the strength characteristics of the paper and helped in obtaining better retention of fines and fillers.

## Three Systems Installed

Consequently, it was decided to install three automatic cooking systems, one to supply starch paste for wet-end addition on both machines and two to serve the size presses. The systems were custom-designed to meet Monadnock's needs, and Staley engineers assisted in the installation and start-up.

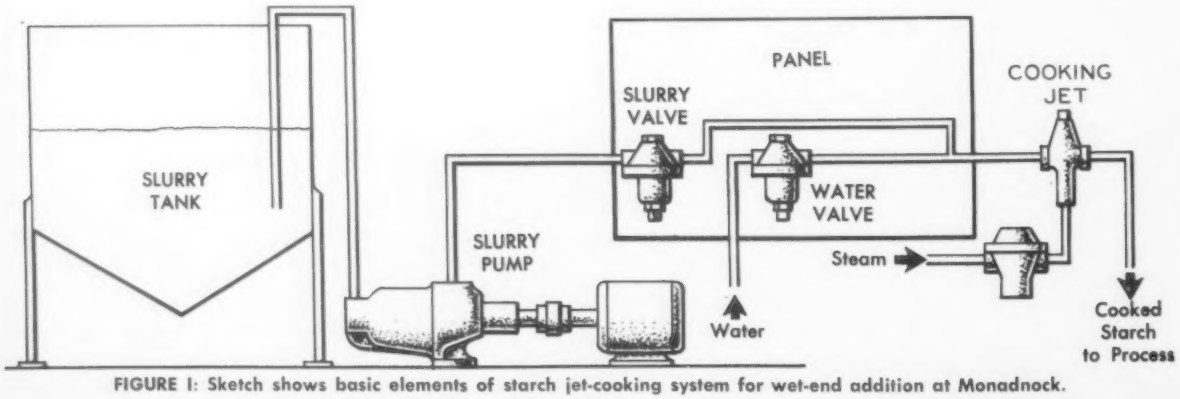
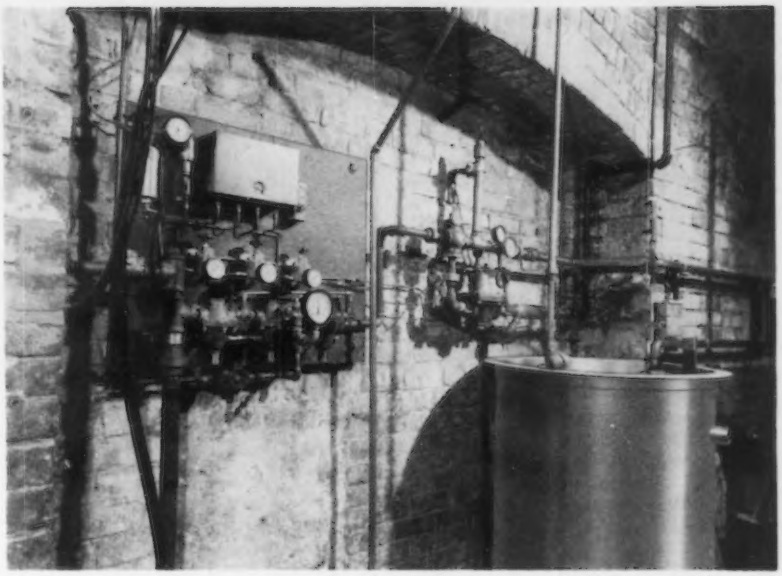



**FIGURE 1: Sketch shows basic elements of starch jet-cooking system for wet-end addition at Monadnock.**

All three systems are basically similar in design. They may be defined as means for producing, from bagged starch, a constant flow of a uniform finished paste with a wide range of properties that can be consistently and automatically reproduced. Each is equipped with variable solids output and has fully automatic on-off controls.

A simplified sketch of the cooking system for the wet end is shown in Figure 1. Concentrated slurry of uniform solids is pumped from the supply tank through the slurry valve, which permits simple adjustment of the percentage of starch in the final cooked paste. After passing through this valve, the slurry is met by a stream of water that is automatically controlled at the proper volume by the water dilution valve, and the diluted slurry passes to the cooking jet.

Simultaneously with the flow of slurry and water, the steam valve opens and admits steam to the jet. The steam under high pressure mixes completely with the starch slurry, rapidly heats it, and cooks it within a few seconds.



**Control panel, jet cooker and service tank for wet-end cooking system are located in machine room basement. Cooking jet is in tee to the right of control panel.**

## Wet End System

At Monadnock, because the system supplies the wet end of two paper machines, the cooked starch is delivered to a small service tank equipped with high-low level controls that automatically start and stop the flow of cooked starch.

In other paper mills, where the system supplies only one machine, the cooked starch is frequently fed directly into the fan pump, with an electrical interlock on this pump to control the on-off operation of the jet cooker. An alternative point of addition is the stock chest, in which case the controls are interlocked with the stock pump.

Provision for starch-slurry preparation is considered an integral part of the complete cooking unit and the slurry system itself is of patented design. It is so constructed that a single tank serves both for make-up and for storage. Monadnock has installed 1,400-gallon stainless steel tanks for each of its cooking systems. Each tank is equipped with a Neptune Auto-Stop water meter that is adjusted to deliver the required volume of water for each 100-pound bag of starch that is dumped.

In slurry make-up, the operator trips the meter lever one time before he dumps each bag, repeating this operation as often as needed. Such a routine prevents error and eliminates any measurable variation in slurry concentration.

The method for controlling final starch solids is also unique. The flow of concentrated slurry into the system may be varied while the total volume ouput remains constant. Thus, as the slurry input is raised or lowered, the flow of dilution water is automatically decreased or increased proportionally.

The cooking system is self-cleaning. When the high-level control in the service tank shuts the system off, flow of slurry, dilution water and steam all stop simultaneously. At the same time, a flushing valve automatically opens long enough to admit a spurt of water into the system to clean it out.

If during normal operation any emergency arises—such as the failure of the supply service of steam, water, slurry, or pressure-regulating air — the system immediately and automatically shuts itself down, also flushing itself out as in normal shutdowns. Then, as soon as the defective supply service is restored, it returns to normal operation automatically.

## Size Press System

The primary difference between the wet-end cooking system and those for the size press is in the method for diluting the concentrated starch slurry. No flow meter is used in the Monadnock wet-end cooker because of the reliability of the controls and because changes in starch concentration are infrequent.

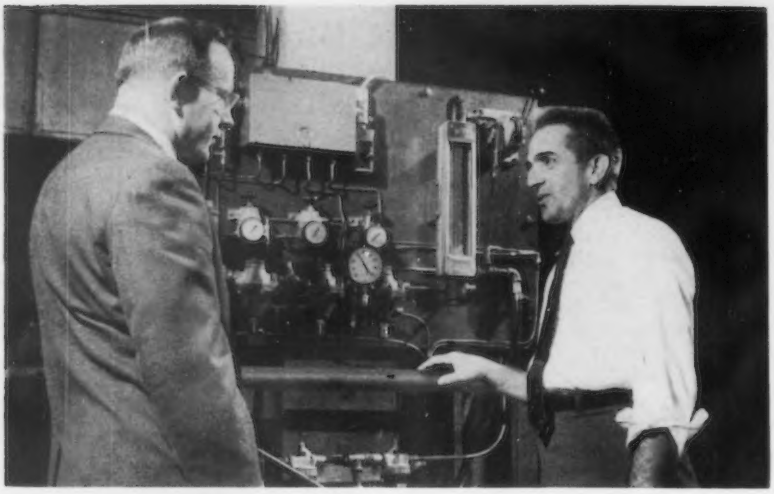
At the size press, starch concentrations range from 3 per cent to 12 per cent and a simple means is required for verifying final paste concentrations. A rotometer is, therefore, included on the control panel of each size-press cooker.

Because high-solids slurries are too opaque to be read, the dilution water rather than the starch slurry is passed through the rotometer. However, since total volume output of the system is constant, this modification presents no problems in determining actual starch flow and also the percentage of starch in the finished starch paste. The volume flow of concentrated slurry is simply the difference between total output and dilution-water flow.

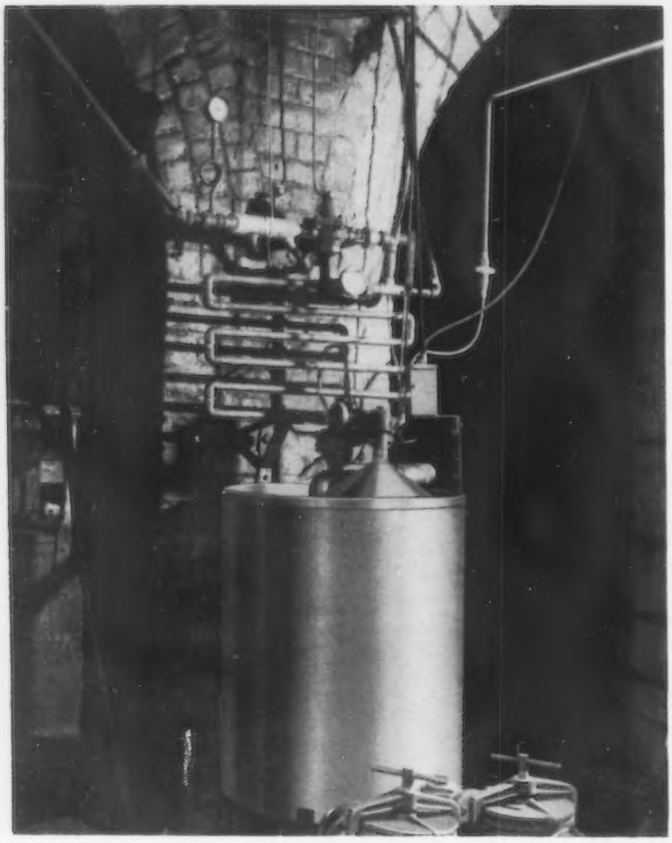
While the application temperature at the wet end is not especially critical, Monadnock generally surface sizes its paper at a temperature of 140° F. To lower the cooked paste to this temperature, it is "surface cooled" by passing it through a coil of pipes exposed to the air. This method of cooling is preferred because it is the simplest, although some size-press jet cooking systems have been built with an additional water valve on the control panel, to add cooling water after the starch is cooked.

## Located for Convenience

Whereas the entire wet-end cooking system was installed compactly in the machine room basement, with the size-press installations Monadnock has taken full advantage of the fact that Staley jet cooking systems are composed of functional



Monadnock Mill Superintendent Anthony Billesimo discusses size-press jet-cooking system with John Walsh, Staley technical representative.



Cooking jets, cooling coils, and service tanks for size presses are installed in machine room basement, while control panels are on floor above, near paper machines.

groups that may be placed at different locations for maximum convenience.

The slurry tanks and pumps are located in the machine room basement convenient to starch storage. The control panels, on which are mounted the primary regulating valves and other control features, are installed by the paper machines, near the size presses.

After the starch slurry is accurately diluted to the desired solids at the control panel, it again passes to the basement where the cooking jets are located. From the jets, the cooked starch passes through the pipe coils into small service tanks directly beneath. Pumps then deliver the starch paste to the size presses on each paper machine.

The Jet Cooking System was initially developed by Staley's specifically for wet-end addition, whereas continuous cooking for surface sizing was a later outgrowth made possible by the development of automatic systems. Yet, strangely enough, manufacturing personnel are even more pleased with the size-press installations than they are with the cooking system for wet-end addition.

In fact, they report that these systems have paid for themselves within the first six months of operation, chiefly because of the much greater uniformity—and consequently, better utilization—of the starch paste.

This improved uniformity has permitted them to reduce starch solids by as much as 3 per cent on certain grades of paper, while gaining improvements in quality at the same time. In these applications, total consumption of starch has been reduced from 30 per cent to 40 per cent.

### Better Printability

An outstanding quality benefit is the improved internal sizing of the sheet, and the sheet has better retention of starch on the surface after it is dried. Both of these properties give the paper better printability. In addition, the paper now has less tendency to curl and has more uniform opacity.

Operating personnel at Monadnock also emphasize the ease of control of starch properties. They point out that they can now make adjustments more rapidly and to closer tolerances. Over-all starch preparation is greatly simplified and working conditions are both cleaner and safer.

At the wet end, as predicted by the preliminary tests, strength characteristics of the paper have improved. The retention of fines and fillers has been even greater than anticipated, some grades of paper showing increases as high as 10 per cent. The average for all grades has been estimated at 3 per cent.

# Characteristics and Uses Of Various High Yield Pulps

**What are the advantages and disadvantages of the various high yield pulping processes? For which end product uses is each type most suited?—The author provides the answers in clear, concise manner.**

**L. E. Eberhardt,**
Assistant to the President,
Bauer Bros. Co.

There is considerable technical and operational data in the literature on practically all phases of high yield pulping. The recent FAO meeting in Tokyo had several papers on this subject and in view of the wealth of literature on high yield pulping techniques, it is thought perhaps a paper discussing the end product uses of high yield pulps would be both timely and constructive.

## Groundwood Pulp

Groundwood was, of course, the first high yield pulp, and in its production, the entire wood substance except water solubles goes into the fibrous end product. The uses, properties, and limitations of conventional groundwood pulp are well known. They are relatively weak, short fibered, of low brightness with good bulking and opacity characteristics. Cost is low in normal situations. Due to its high yield, groundwood contains all the initial wood lignin and other oxidizing wood chemicals; these components cause early brightness loss and brittleness upon aging that provide poor shelf life and limit its use.

Low cost of the pulp makes for use in single service, high tonnage end products such as, newsprint, sanitary tissues, magazines, telephone directory, catalog, and groundwood book grades. It will also be noted that none of these products require long term service so poor shelf life characteristics are no disadvantage in these cases. Groundwood's bulking and opacity characteristics together with its excellent ink receptivity and type cushioning characteristics provide excellent additional advantage in most of the above grades. It has also been used extensively in combination with higher cost chemical pulps as a cost reducing agent in many higher quality end products such as book, bond, printing, magazine, and coating base sheets.

In the cylinder board field, groundwood has always been a liner component and filler material. Lower grade food boards, egg carton, and molding pulps also use groundwood extensively and in the building products field it was the initial pulp used for insulation board and continues to be a major process.

Initial groundwood production was confined to a few of the long fibered, low density, light colored coniferous wood species. These woods are, of course, the most desirable and consequently most expensive for all of the various pulping processes. Later as grinding techniques improved a few low-density, light-colored hardwood species were successfully ground. But actually the wood species used were limited mainly to spruce, balsam fir, hemlock, pine among the coniferous woods, and aspen, cottonwood, willow, etc., among the hardwoods depending basically upon the species available to the pulp mill.

Increasing wood costs and scarcity of these preferred wood species forced a broadening of the area of utilization to less desirable conifers and hardwoods, particularly the higher density or cull hardwoods. This has led to chemically modifying processes such as NSSC, chemi-groundwood, cold soda and steamed wood pulps.

## NSSC Pulp

The neutral sulphite semi-chemical process was developed in the Fiber Products Laboratory, Madison, Wis. in the 1920's. The first application was on chestnut chips that had been extracted for removal of tannins. The end product was nine point corrugating medium. This remains the major use of this pulp even today. For corrugating medium the most important strength factors are stiffness and burst. Another chief requirement is runnability on the corrugator which requires a number of combined factors i.e. tensile, tear, density, permeability, and stiffness.

This indicates one of the outstanding papermaking qualities of NSSC, that of stiffness. It also has excellent dry strength in spite of its short fiber character, but on the other hand has notoriously poor wet end strength. High density, surface toughness (scuff resistance), and lack of opacity upon beating are other characteristics. Good mullen strength and fair tear quality can also be expected.

Unbleached pulp cost lies between groundwood and the conventional chemical pulps. However, bleached to high brightness, the high bleach chemical demand increases end cost until in most cases it is more economical to utilize the bleached kraft method on the hardwoods. This factor of relatively high bleach pulp cost has put a damper on early enthusiasm for use of NSSC in a wide variety of end products.

Glassine and greaseproof papers are an excellent use of neutral sulphite semi-chemical pulp since it is easily beaten to the extreme hydration required by these papers. The pulp can also be used as partial furnish in newsprint, book, bond, catalog, telephone directory, coating base stock, etc., to stiffen up a shoft sheet or provide in some cases a "rattle" to the sheet. Another use is in special sheets where a dense surface or scuff resistant sheet is required. Also NSSC is used where special printing, ink receptivity, or resistance to erasures are required—bond, writing, folding box board, top liner are examples. The pulp is also excellent for use in manila gypsum board liner.

The trend in NSSC yields for nine

Presented by permission of the Japanese Pulp and Paper Association, from a paper given at their March 3, 1961 meeting in Tokyo.

point has gradually increased from the 70-72 per cent level to 78 to 85 per cent as the demands for stiffness increased. For paper grades the unbleached yield range generally varies from 55 to 70 per cent yield. As we progress through these yield ranges, we find maximum stiffness at the high point gradually decreasing or becoming softer as yield decreases. Ease of beating or strength development of course improve with decreasing yield.

It will be noted that practically all these uses except nine point boards are specialties. In my opinion this will be the role of NSSC in the future. At one time it was thought that NSSC would be much more important. I believe, however, it has given way in many cases to the cold soda pulping method.

## Cold Soda Pulps

Cold soda pulp is a more recent development of the Forest Products Laboratory, the initial development period being in the late 1940's or early 1950's. First commercial activity was at Green Bay Pulp and Paper about 1952 where cold soda on poplar was used for nine point corrugating medium. This early attempt was abandoned in favor of NSSC when it was found cold soda nine point was not quite high enough quality for a highly competitive commercial market. The first major successful cold soda pulp operation was that of Gould Paper Co. where Gould and Bauer cooperatively installed the so called "Bauerite" system for production of bleached cold soda pulp for book and bond papers. Within the past year the Gould tonnage has been doubled with addition of more equipment. A number of other installations have been made in the U.S. There are, of course, several good units operating in Japan the latest being Daishowa Paper Co., Shiraoi, Hokkaido and Oji Paper Co., Tomakamoi, Hokkaido.

Cold soda pulps must be considered in two different classes dependent primarily upon yield level. As yield decreases from say 90 per cent to 80 per cent there is a sudden change in pulp characteristics at approximately 85 per cent yield (exact point depends mainly upon wood species); above this transition point the pulps have many of the characteristics of groundwood i.e. good bulk, opacity, softness, etc. Below the transition point the pulps are more like nine point NSSC and exhibit stiffness, "rattle," higher density, and poor bulk and opacity. For sake of this paper we will define the 85 plus pulp as ultra high yield cold soda pulp. Those below 85 per cent yield being considered plain cold soda.

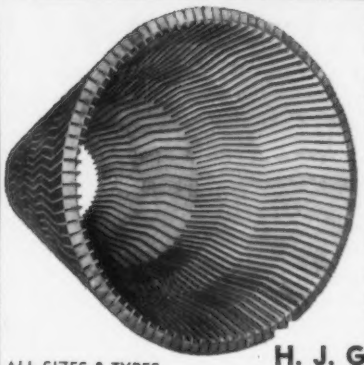
Ultra high yield cold soda is very similar to softwood groundwood in characteristics, tear, mullen, tensile, bulk and opacity. Brightness is, of course, considerably lower and the pulps require bleaching with peroxide and/or hydrosulphite for most end products. These pulps were initially used as substitutes for softwood groundwood pulp in newsprint and book papers. It is probable that such substitution will continue and expand to other groundwood containing papers and boards such as catalog, directory, tissue, toweling, gypsum board liner, folding box liner stocks, food board, molding pulps, egg carton stock, insulation board, etc.

These hardwood cold soda pulps can be freely substituted for softwood groundwood pulp in practically any groundwood containing sheet. The limitation on use of ultra high yield cold soda pulp is determined mainly by brightness and strength

*(Continued on page 52)*

**SUMMARY OF HIGH YIELD PULP CHARACTERISTICS**

| | Wood Types Utilized | Burst Strength | Tear Strength | Unbleached Brightness | Bulk | Opacity | Stiffness | Bleachability | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| Groundwood | Most softwoods and few hardwoods | Poor | Poor | Fair depend upon wood used | Excellent | Excellent | None | Responds to peroxide & hydro | Poor shelf life |
| Neutral Sulphite Semi-chemical | All hardwoods | Excellent | Fair | Fair | Poor | Poor | Excellent | Good | |
| Cold Soda Pulp Ultra High Yield | Most hardwoods | Fair | Fair | Poor | Good | Good | Poor | Same as groundwood | |
| Cold Soda Pulp Below 85% Yield | Most hardwoods | Good | Fair | Poor | Fair | Fair | Good | Same as groundwood | |
| Cold Soda Pulp | Softwoods | Good | Fair | Poor | Fair | Fair | Poor | Very Poor | Not practical, use sulphite or bisulphite |
| High Yield Acid Sulphite | Softwoods | Excellent | Good | Good | Fair | Fair | Fair | Fair | |
| Ultra High Yield Bisulphite | Softwoods | Good | Good | Good | Excellent | Excellent | Poor | Excellent | |
| Chemi-groundwood | Hardwoods | Fair | Fair | Fair | Excellent | Excellent | None | Fair | |
| Chemi-groundwood | Softwoods | Fair | Good | Fair | Excellent | Excellent | None | Poor | Too much power required |
| High Yield Kraft | Softwoods | Excellent | Excellent | Poor | Poor | Fair | Fair | Very Poor | Only good for liner board grades |



**JORDAN FILLINGS**

**BARS:**
Carbon Chrome Steel heat-treated bronze, or Stainless hardened.

**SPACERS:**
Maple, Oak, or laminated plastic.

**PLUG:**
Band or dovetail type.

**SHELL:**
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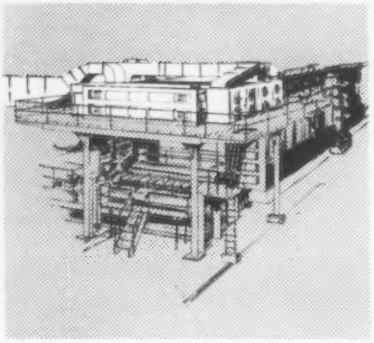
SF NEWSLETTER

# SF PULP COOLING ENDS BRIGHTNESS REVERSION



The battle for brightness of your pulp results in a Pyrrhic victory at best if your pulp undergoes a reversion from its brightness while in the bale. The more efficiently, in fact, that your plant's bleaching process is carried out, the greater is your loss from pulp that loses part of its whiteness before it gets to your customer.

The remedy? The SF Pulp Sheet Cooler, Type L*, shown above in a typical installation atop the cutter of a machine. As in the SF Flakt Dryer*, the Cooler forwards the pulp sheet with a stream of air, using no mechanical conveyors. With this cooler in operation in conjunction with your machine, color reversion is virtually eliminated.

How about economy? Besides increasing the efficiency of your bleaching operation, the SF Pulp Cooler provides these other economies: a stream saving through evaporation in the cooler, which uses only the heat from the hot sheet . . . easier cutting and handling at the dry end . . . no condensation or sweating after baling, permitting the pulp to be directly loaded into boxcars . . . more accurate measurement in moisture tests than is possible with a hot, moist sheet.

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## . . . High Yield Pulps

*(Continued from page 50)*

considerations both of which are in turn dependent upon wood species available as the raw material. The lower yield cold soda pulp, because of its lack of opacity, will primarily be used in the heavier weight sheets and boards. Bleached food boards and nine point are two good examples. the other outstanding characteristic of the pulp, stiffness and/or "rattle" is of course the major requirement for nine point. It is probable that in some cases cold soda pulp will be used for this quality alone to impart stiffness into a "limp" sheet; for example, newsprint made from southern pine.

The cold soda process is particularly well suited to the processing of hardwoods. The coniferous woods in most cases show little or no response to the process. And quality improvement over groundwood from the same wood is usually only slight. Also in many cases the resultant pulp is a relatively unbleachable yellow color. It is doubtful that softwood cold soda pulps will be used in paper and board to any degree comparable to hardwood.

### High Yield Sulphite Pulps

*Acid sulphite softwood high yield pulp* is merely the high yield version of standard commercial unbleached sulphite paper pulp which is, of course, used in many paper and board grades. The pulp (yield range 55 per cent to 75 per cent) is similar in all respects (except bleachability) to the conventional sulphite pulp and therefore has most of the same end product uses. The major application will be newsprint since most of the existing newsprint mills have an integrated sulphite mill and will convert to high yield processing because of economic necessity and stream pollution, and wood cost factors.

Magnesium soluble base sulphite pulps (Magnefite) are being extensively investigated by the Howard Smith Paper Co. and indicate excellent possibilities on both hardwoods and softwoods for fine papers.

*Ultra high yield bisulphite pulp*, recently reported at a TAPPI meeting by Mr. Richardson of Blandin Paper Co., is proving an excellent pulp in coated book papers. The pulp has very interesting characteristics; groundwood bulk and opacity, with strength values approaching sulphite pulp. These unique properties appear to indicate a bright future for the pulp in many end product grades. The pulp also has a "softness" quality which would appear to indicate an excellent application in the tissue field. Other end products uses would appear to be bond, catalog, telephone directory.

*Hardwood ultra high yield sulphite pulp* is being used very effectively as a major component in newsprint, an excellent example being the Jujo Paper Co.'s Kushiro Mill, a 160 ton/day installation. It will also be used extensively in coating base stock, tissue grades, and other end products as a replacement for softwood groundwood pulps. On most wood species unbleached brightness is fairly high and in many instances the pulps can be readily bleached to high brightness (78-80 G.E.) These factors of course indicate a widened field of application for the pulp.

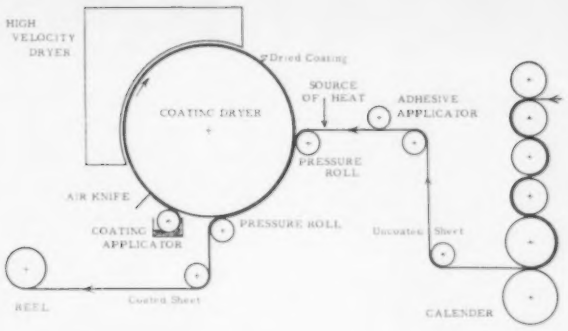
### Single Furnish Newsprint

The development of ultra high yield sulphite and groundwood from chips has raised the possibility of a single furnish newsprint, in which case all of the chips would be given a mild sulphite chemical impregnation and refined at groundwood power input levels, the end product pulp having the necessary strength, bulk, and opacity characteristics for runnability. Based on wood the combined yield of a conventional groundwood softwood and softwood low yield sulphite news sheet is approximately 80-83 per cent. By application of the above technique with a single furnish type sheet it might be possible to raise this figure to approach 90 per cent. This, of course, would have a large impact on the wood procurement and raw material cost problems in a newsprint mill. In Japan the sheet would have to include hardwoods which could be done with a sheet of say 50 per cent hardwood cold soda and 50 per cent ultra high yield softwood sulphite.

### High Yield Kraft

Softwood high yield kraft pulps are not truly high yield in the sense yield is used in this paper since high yield pulps by the kraft process rarely exceed 60 per cent based on wood. The pulps are very limited in application due to dark color and poor bleach response, the only commercial applications being liner board and some nine point.

The preceding provides a brief indication of the end product uses of the various types of high yield pulps. It would appear that high yield pulps will have a large place in the paper production picture for years to come.




**Artist's conception of the Glosscoat on-machine cast coater.**

# *Now*...On-Machine Cast Coating In Color!

**With IFB's Glosscoat process, not only are pastel colors and heavy weight high-gloss boards possible, but cast coating is done on the cylinder machine.**

Interstate Folding Box Co. formally unveiled its dramatic new product—*Glosscoat*—the brainchild of a $500,000 research and development program by this Middletown, Ohio firm. Glosscoat is a high-gloss cast-coated boxboard believed to be the first ever to be made directly on the machine, and the first cast-coated board ever manufactured in the heavier weights up to 36 points in caliper. In addition, it is the first cast-coated board ever available in pastel colors (ten at this time, ranging from strawberry ice to canary, to eggshell to pale aqua). Its packaging uses are reported to be virtually limitless and applications in allied fields are being explored as well. The cost of the installation of the new 100-inch wide on-machine production model coater has added another $500,000 to the R & D costs.

Conventional cast-coating requires off-machine operation, and is limited to the low speed production of only white color on paper or lightweight paperboards. However, Interstate's pre-cast coating operation has been incorporated into an existing 100-inch wide six-cylinder board machine at the Miamisburg, Ohio, mill. The coater, which weighs over 50 tons, is installed on vibration-free platform between the calender and reel. Our artists' conception of the Glosscoat coater, interpreted from data contained in the U. S. Patent and from certain information released by Interstate, is depicted in the accompanying sketch. Black-Clawson Co. built the coater following Interstate's blueprints, and supplied the components, including the drive (which is synchronized with the 300 f.p.m. cylinder machine drive).

Central to the coater is the 96-inch diameter 100-inch face chrome-plated Yankee-type dryer. This drum is internally heated to 180° to 200°F. The coating solution is applied directly to the drum by a spray, knife or roll; its thickness can be controlled to 1 mil by an air-doctor following the application. The coating is rapidly dried as the drum revolves. This drying time may be accelerated by external means, such as infra-red lamps or a heated air stream up to 200°F. It is known that Interstate employs a sectional high velocity dryer on their installation. Depending on thickness, heat, and type of coating, drying can be completed in 30 seconds to 1 second or less.

The base sheet, as it emerges from the smoothing calender is coated with a special adhesive mixture. This sheet is then brought into contact with the dried coating lamina on the chrome-plated drum, and which is permanently bonded to the adhesively-coated sheet by the pressure of rolls against the drum. The coated sheet is then stripped from the face of the drum and passes into the reel.

The coating composition is conventional. The pigment may comprise in amount 90 to 70 per cent clay, calcium carbonate, or titanium dioxide, and the binder may comprise 10-30 per cent casein, alpha protein or acrylic polymer. Dispersing agents, defoamers, or pH modifiers are permissible in the coating formulation.

The general procedure is to disperse the pigment in water to form a slurry of from 50 to 65 per cent solids. If casein or alpha protein is used, these are first cut in ammonia water at about 15 to 25 per cent solids. In the case of emulsions they are usually used in latex form as supplied. The binder solution or emulsion is then added to the clay slurry and sufficient water added to bring the overall solids contents of the coating to between 45 and 65 per cent. The coating when dry and bonded to the sheet should consist of 10 to 25 pounds of solids per ream.

A key factor in the success of the transfer of coating lamina from the drum to the sheet lies in controlling the moisture content of the adhesive to a low degree that strike through the coating does not disrupt its surface gloss. The other very critical control is the degree of drying to which the coating is subjected.

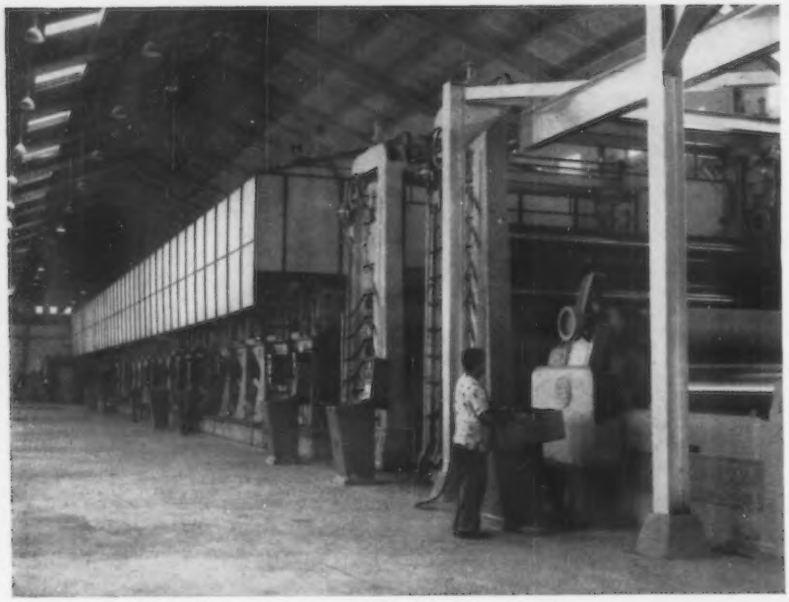
The stripping or bonding adhesive may be applied in any conventional manner and may comprise a starch or protein base, polyvinyl acetate or polyvinyl alcohol in which solids contents is from 20-50 per cent. Application of 2-3 pounds of dry adhesive per ream has proven satisfactory.

It has also been satisfactory to use hot melt adhesive and reactivate it with heat at the instant of combining. This melt can be applied either in its melted state, in solvent solution or suspended in water. The hot-melt adhesives may also contain water-proofing wax, or powdered aluminum, titanium dioxide, clay, or calcium carbonate to increase its opacity. Interstate has also found it beneficial to include coloring agents (e. g. satin whites, blanc fixe) in the adhesive. This procedure particularly enhances chipboards or other low grade stock.

## Seven Definite Advantages

Frank D. Bergstein, Glosscoat's originator, lists seven advantages to his pre-cast coating method: (1) multiple coating boxes and additional dryer sections which are characteristic of machine coating are not required; (2) Shorter drying time is possible since the coating can be dried on both sides simultaneously and the moisture does not have to be driven through the base sheet. Problems due to shrinking and stretching of the sheet and coating strike-through are eliminated; (3) Transferring the dried coating lamina to the sheet does not alter the characteristics of the sheet nor the coating layer; (4) Variations in the caliper of the base sheet are compensated for by the adhesive coating. This uniformity of coating layer enhances printing characteristics; (5)

*(Continued on page 56)*



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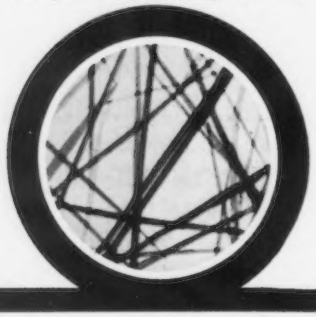
*This new integrated pulp and paper mill produces 100 tons per day of high grade bleached and unbleached papers from sugar cane bagasse fiber. Our Organization supplied this project with technical assistance and the major production equipment including a Horkel System for depithing and cleaning the raw bagasse, a Pandia Continuous Digester and the Black-Clawson fourdrinier paper machine shown here.*

Completely depithed bagasse fibers



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These Latin American projects are but two of the 25 pulp and paper mills throughout the world for which the Parsons & Whittemore-Lyddon Organization has provided full or partial planning, technical, economic, and construction services. Twelve different papermaking fibers are utilized among these projects. We even supervise start-up and train local operating personnel, and can arrange for sale of the output on world markets. For literature and full information on how our services can benefit your mill projects, write our nearest office.

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# A Nalco PRODUCT MANAGER

# Answers Questions About Slimes in Pulp and Paper Mills

## Facts about a tough, continuing paper mill problem

Slimes are expensive—whether they slow production, spot finished paper, produce foul odors, increase maintenance time and expense, or corrode equipment, they cost the papermaker money. Here are a few of the more common questions about papermill slimes and slime control, answered for you by J. R. Nelson, product manager of Nalco Chemical Company's paper chemicals department.

**Question:** What Are Slimes?

**Answer:** Microbiological slimes are deposits of substances exuded by microorganisms, and chemical slimes are accumulations of water-borne fibers and chemicals. Microbiological slimes serve as a binder for chemical slimes, which in turn harbor the microorganisms which produce microbiological slimes. Slimes, however, are *not* microorganisms, but rather are substances produced *by* microorganisms.

**Question:** Why is slime control difficult in the paper industry?

**Answer:** Because paper mill systems provide the food supply, moisture, darkened recesses, and temperatures ideal for slime growth. Some organisms, not considered slime-producers in other industries, become of serious concern to the papermaker because of these ideal growth conditions.

**Question:** How can slime be controlled?

**Answer:** By establishing and maintaining a complete slime control program, to include chemical and physical analyses of the troublesome deposits, a survey of the paper mill system, and the application of chemical and mechanical slime control methods.

**Question:** What are the major considerations in a slime control program?

**Answer:** Types of organisms, points of infection, and flow of infection. Microbiological analysis of slime deposits shows which particular slime-forming microorganisms (spore formers, non-spore formers, fungi) are present in a given system, and analysis of stream samples points out centers of infection and flow of infection. In addition, an overall engineering survey of the entire system should be made, including flow diagrams, information on chemicals and raw materials used, water consumption rates, points and quantities of white water usage, system temperatures, and pH conditions. All of this information is then coordinated into a program of control.

**Question:** Who does the coordinating?

**Answer:** Your Nalco field representative can do it for you. Working in your mill, with your personnel, he will determine the best overall slime control program for your particular system. In addition to his own skills and experience in slime control, the Nalco field representative has the skills, experience, and facilities of Nalco's laboratories to call on if necessary.

**Question.** What does Nalco offer in the way of slime control?

**Answer:** A wide variety of quality products, excellent customer service, and a solid foundation of slime-control experience and knowledge. Nalco slimicides are available for use under any number of conditions—against different types of slime formers, in acid or alkaline operations, for continuous, intermittent, or slug feeding. No single slimicide can control all kinds of slime under all conditions, but your Nalco field representative can find the right combinations of slime-controlling chemicals for your mill, and determine the most economical method of application. The Nalco field representative will serve as a slime-control consultant—and even if there is a question he isn't able to answer immediately, he knows where to go to get the information he needs: Nalco's laboratories.

**J. R. Nelson, Product Manager**
**Paper Industry Chemicals Department**

**Question:** Why are there occasional flare-ups of new types of slime, even where a slime control program is in effect?

**Answer:** Because microorganisms compete for food. As one type of microorganism is eliminated, more food becomes available for other types. Other organisms get more food, thus flourish. Also, new types of microorganisms may be carried into the mill system via air, water, or raw materials. That's why a slime control program must be a continuing effort, ready to counter and destroy any new type of organism as soon as it appears.

**Question:** What's new in slime control?

**Answer:** Among other things, Nalco's organo-sulfur slimicides, available in liquid (Nalcon 242 and Nalcon 248) and solid ball briquette (Nalcon 245) form. These Nalcon slimicides are effective additions to Nalco's proven line of slime control chemicals.

**Question:** What are Nalcon slimicides?

**Answer:** A combination of a potent organo-sulfur microbiological agents and powerful dispersants. The organo-sulfur agents destroy slime producers (especially effective on non-spore formers) while the dispersants have a dual function—they carry the organo-sulfurs to every part of the system, and they break up deposits of chemical slime. Nalcon slimicides aren't retained in finished paper, are non-phenolic and non-metallic. They have also been approved by the U.S. Food and Drug Administration for use in the manufacture of paper products to be used for food packaging.

**Question:** How quickly can an effective slime control program be established?

**Answer:** As quickly as you wish. Call your Nalco representative for prompt action, or write me for further details: J. R. Nelson, Product Manager, Paper Industry Chemicals Department.

"Nalcon" is a trademark of Nalco Chemical Company

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Inexpensive water-borne adhesives and conventional mineral coating material may be used which do not add materially to the cost. The use of solvents are practical, and because they are driven off prior to combining, there are no damaging effects to the sheet; (6) The use of adhesives enhances bendability and flexibility of the coated board; (7) Any base material, regardless of its permeability, may be coated. This includes not only paper and paperboard, but chipboard, internally waterproofed board, foil laminated boards and non-fibrous films.

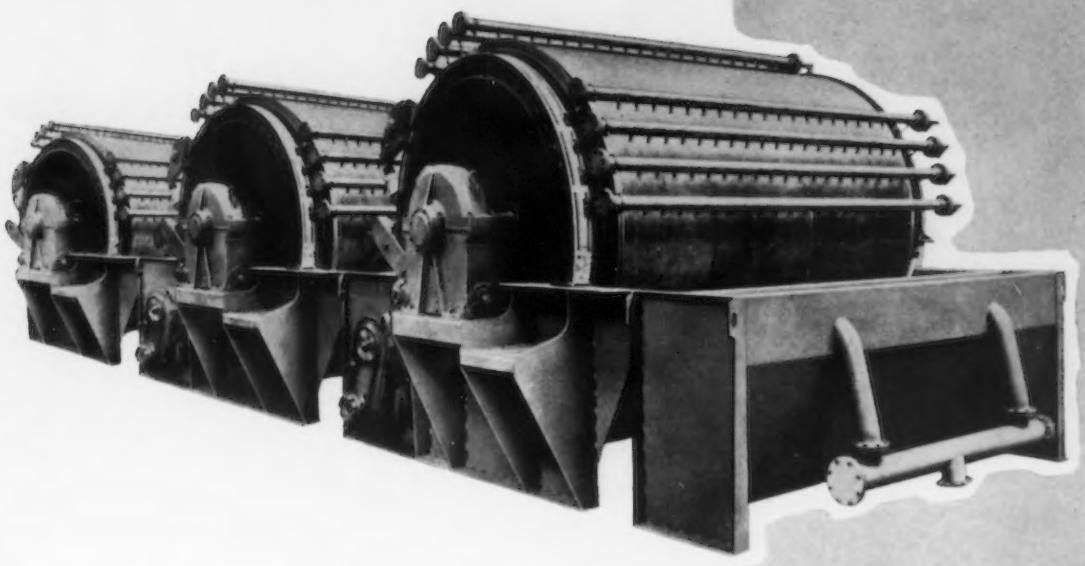
Glosscoated board presents a smooth, uniform surface capable of full-line, full-color printing, say Interstate spokesmen. It is also much more flexible than other types of coated board, and reputedly will not crack or peel, when folded over to a high degree. It exhibits a high resistance to fading, and because the coating does not deteriorate with age it resists dust, water, grease and general shelf abuse. No overprint varnish is required as is practiced with some other coated boards.

### Many Uses Foreseen

What of the possible uses for Glosscoat? Among the first applications are inner-lined containers, a patented bag-in-box structure often called the "folding can" and made with single or two compartments (which contain hygroscopic food products, for instance, of a powered, flaked or dried nature). Other products developed and patented by Interstate which are already making use of Glosscoat board include "Foldomatic" boxes and Super Cell egg cartons. Interstate has accepted that, with its color values, and flexibility made possible by on-machine cast coating, Glosscoat is ideal for point-of-sale products of all types and, in fact, can be used in almost any area in which printed paperboard is applied.

Headed by Robert M. Bergstein, president and treasurer, and his brother, Frank D., the 50-year old Interstate firm makes and converts a long line of paperboard products (including bleached manila-lined chip; patent coated; double white lined; colored specialties; laminating board; white vat-lined, bending and set-up chip boards) into folding boxes, packages, and protective cartons.

Interstate's Glosscoat process is described in U. S. Patent 2,934,467, assigned to Frank Bergstein. Mr. Bergstein is scheduled to present further details about pre-cast coating at next month's TAPPI Coating Conference in Buffalo.



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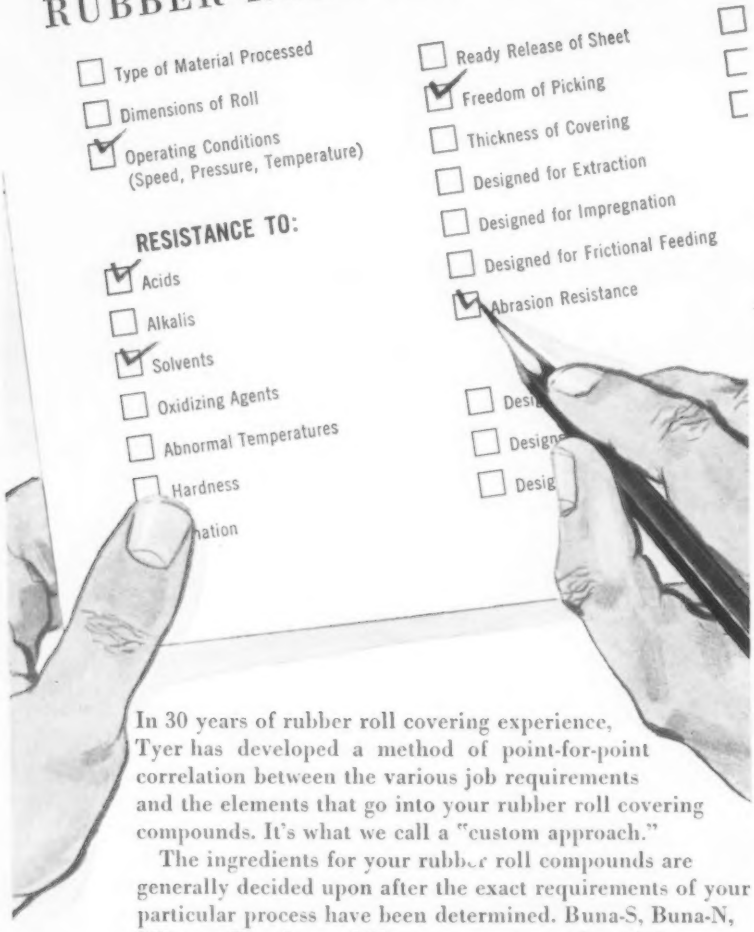


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## PJT NEW LITERATURE

**Application File for Pulp and Paper Industry**

Shows how and where to use jet apparatus to improve pulp and paper processes. Flow sheets, application drawings and performance data are used. The nature of the ingredients used in the manufacture of pulp and paper makes the jet an ideal means of moving, heating and mixing of slurries, liquids and gases. Bulletin. Dept. JA-37, Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.

**Bechman Model G and Model GS pH Meters**

Describes the Model G pH meter, used for research analyses, routine pH and millivolt determinations, and quality control applications. Model GS pH Meter is a modification of the Model G, employing two additional operating controls to provide 20 times greater meter sensitivity and an eight-fold increase in readability. Included are photographs, specifications, how to order, special accessories, etc. Bulletin 719-B. Bechman Scientific and Process Instruments Division, Beckman Instruments, Inc. Fullerton, Calif.

**ElectroniK 17 Recorder**

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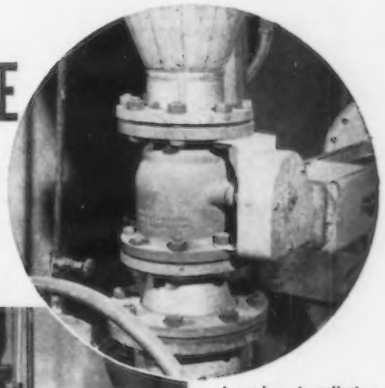
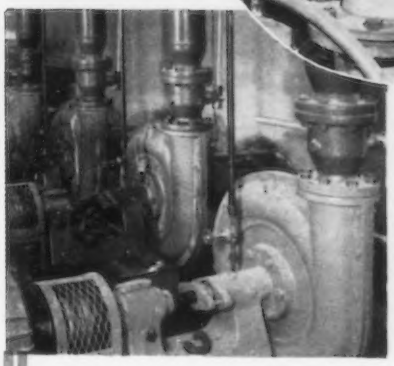


Jamesbury installation at Weyerhaeuser Longview Plant



Jamesbury installation at Mead Corporation Chillicothe Plant

As varied as the valving requirements are in pulp and paper processing, the Jamesbury "Double-Seal" Ball Valve is meeting them successfully. Jamesbury offers a functional, efficient, economical Ball Valve which has proved itself in performance in many major installations such as the examples shown above.

**Greatest Range of Ball Valve Sizes and Materials Available**

Jamesbury "Double-Seal" Ball Valves are available in Types 303, 316 and Alloy 20 Stainless Steels, Carbon Steel, Bronze, Ductile Iron, Aluminum and PVC. Other materials on special order.

Interchangeable seats and seals are available in "Teflon", Nylon, Buna-N, Neoprene, Hypalon and natural rubbers.

Pneumatic, Hydraulic and Electric Motor Operators to fit Remote Control Requirements.

*Patented

**Jamesbury Ball Valve Versatility Is Proving Itself In These and Other Services**

Spent Acid Lines • Sodium Dioxide • Calcium Hypochlorite $CO_2$ • Sampling Lines • Stock Lines • Bleach Lines • Liquor Lines $H_2SO_4$ Black Liquor Recovery Service • Kraft Mill Digester Service • Chlorinated Stock Service Brown Water $SO_2$ Service • Instrumentation Lines • White Water • Water & Pulp Grinder Water in Filtration Plant • Digester Gas-Off Digester Blow Service • Vacuum Service Power Boiler • Gas Service • General Caustic Service • Alum Lines • White Liquor Fill Vortrap Drain • General Air Service Kaolin Clay Service • Paper Filler Service Glue & Paste Service • Pilot Laboratory Demineralizer Coating • Color Rooms • Paper Machine Showers • Hydrogen Peroxide • Rapid Cycle Digester Service • Hydrogen Gas Service Boiler Water Treatment System • Ash Elimination Dry Chlorine Service • Starch System.

**SIZES**
Screwed End 1/4" thru 3"
Flanged 1/2" thru 10"
150# and 300# series

*Send for Jamesbury's Pulp and Paper Brochure*

**JAMESBURY CORP.** 96 NEW STREET, WORCESTER, MASS.
*Distributors in Principal Cities*

325-O

range card, actuation board, case, etc. — are interchangeable. Instruments make use of a new measuring circuit, are portable, fit a standard 19-inch relay rack, and have a calibrated accuracy of ¼ per cent of instrument span. Bulletin. G. A. Reed, Product Editor, Minneapolis-Honeywell Regulator Co., Wayne and Windrim Avenues, Philadelphia 44, Pa.

**Fuller Improved Type Motion Safety Switch**

Tells how to give reliable protection to belt, chain and screw conveyors, elevators, rotary and screw feeders and any other equipment and auxiliaries that would be damaged by stoppage or plugging. Design, installation and operation are described, as well as typical applications. Two installation photographs and a cutaway drawing of the switch are included. Bulletin MS-3. Fuller Company, Catasauqua, Pa.

**Kraft Liquor Evaporator Control**

Describes this three-element effluent (heavy liquor) density control system, applicable to pulp paper mills and continuously balanced with total thin liquor flow rate through the action of the variable ratio controller. Tells how the performance of the evaporator phase of the Kraft Recovery System can be greatly improved by the application of the Bailey multi-element evaporator control system. Bulletin No. 4. Bailey Meter Co., 1050 Ivanhoe Rd., Cleveland 10, Ohio.

**Norcross Viscometer Receivers**

Describes Series R3 Recorders which contain synchronous motors, switches and other necessary electrical and mechanical components to record accurately the time of fall of the piston rod assembly in Norcross Viscometer Measuring Elements. The recorded results are a measure of viscosity and the chart is in uniform divisions from 0 to 100 which can be calibrated into any viscosity units desired. Bulletin No. V1240. Norcross Corp., 247 Newtonville Ave., Newton 58, Mass.

**Reference Manual on Automatic Weight Sensing**

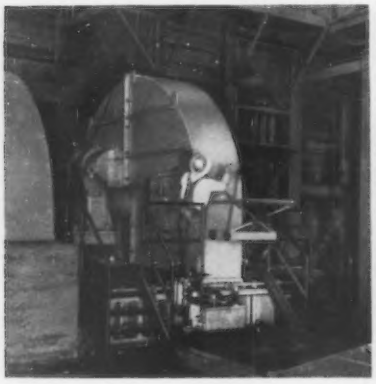
Designed as an idea stimulator to show how the principle of weight sensing, or measurement of force, can be utilized to perform a wide variety of production and quality control functions. Applications are based on a proven weighing principle developed by this company. The Shadograph scale principle consists essentially of a one-to-one ratio predetermined weight scale with a transducer for converting lever movement into an electrical readout signal. Each system is custom engineered to fit a specific application. Reference Manual, 3513. The Exact Weight Scale Co., Dept. "P", 920 W. Fifth Ave., Columbus 15, Ohio.

**Solution Resins**

Gives information on the preparation and application of vinyl solution resins for coating metal, wood, paper, fiberboard and rubber. Included also is a listing of the physical properties of BFG Chemical Geon resins suitable for solution coatings including those approved by the U. S. Food & Drug Administration for food packaging applications. Explains methods of determining the best resin solution, and discussion on mixing, etc. Booklet. Advertising Dept., B. F. Goodrich Chemical Co., 3135 Euclid Ave., Cleveland 15, Ohio.

**Temperature Controls, Detectors, Indicators**

Gives brief descriptions and specifications for 17 different types of temperature controls. Is designed as a handy reference folder for engineers and enables the engineer to request more details on the controller best suited for his particular requirements. Included are details on 12 styles of Thermoswitch units, six miniaturized local controls, four fire and overheat detection models, four snap action controls, and seven electronic controllers. Brochure, MC-203, Fenwal Inc., Pleasant Street, Ashland, Mass.

**BETTER CHIPS means BETTER cooking YIELD**

- MADE IN DISC DIAMETERS FROM 36" TO 153".
- COMPACT, MURCO ROUND LOG PULPWOOD CHIPPERS REQUIRE LESS FLOOR SPACE.

MURCO Round Log Pulpwood Chippers are designed to include the most desirable features for today's production requirements . . . the result of long and careful study of the various features that contribute to outstanding chipper performance in producing more and better chips at less cost . . . less sawdust, fewer slivers, freedom from repairs yet at the same time having production records of 100 cords or more per hour. The MURCO heavy design construction reduces vibration.

All backed by years of constant development so that each year results in an improved chipper design, the latest of which is MURCO UNI-CHIP that produces more uniform chips with less bruising.

MURCO UNI-CHIP is furnished "when specified" on all new MURCO Chippers — or your present MURCO Chipper can be adapted to it.

**MURCO ROUND LOG PULPWOOD CHIPPERS**

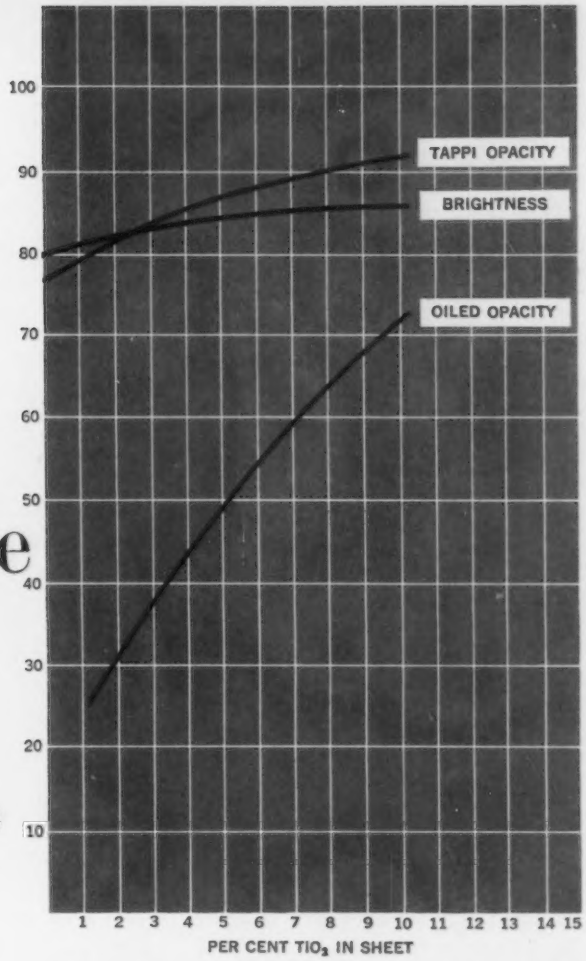
**WRITE for MURCO Chipper booklet.**

A complete and detailed story on pulpwood and wastewood chippers . . . specifications of each model . . . yours upon request. Write for it today.

**D. J. MURRAY MANUFACTURING CO.**
MANUFACTURERS SINCE 1883 • WAUSAU, WISCONSIN

MURCO

# an outstanding titanium dioxide pigment made specifically for YOU




**UNITANE® 0-120** This new pigment has been developed especially for the paper industry to give maximum retention. Designed specifically for wet-end additions, it has the same high brightness and opacity as the other well-known grades of UNITANE, and in tests with chlorinated starch has repeatedly given higher retention than any other titanium dioxide tested. These excellent properties are easily translated into savings for you—maximum opacity with minimum white water losses, high brightness with minimum show-through at lower basis weight, and good printed opacity. The curves illustrate the brightness, TAPPI opacity and oiled opacity obtained with UNITANE 0-120 at various concentrations of $TiO_2$ in the sheet.

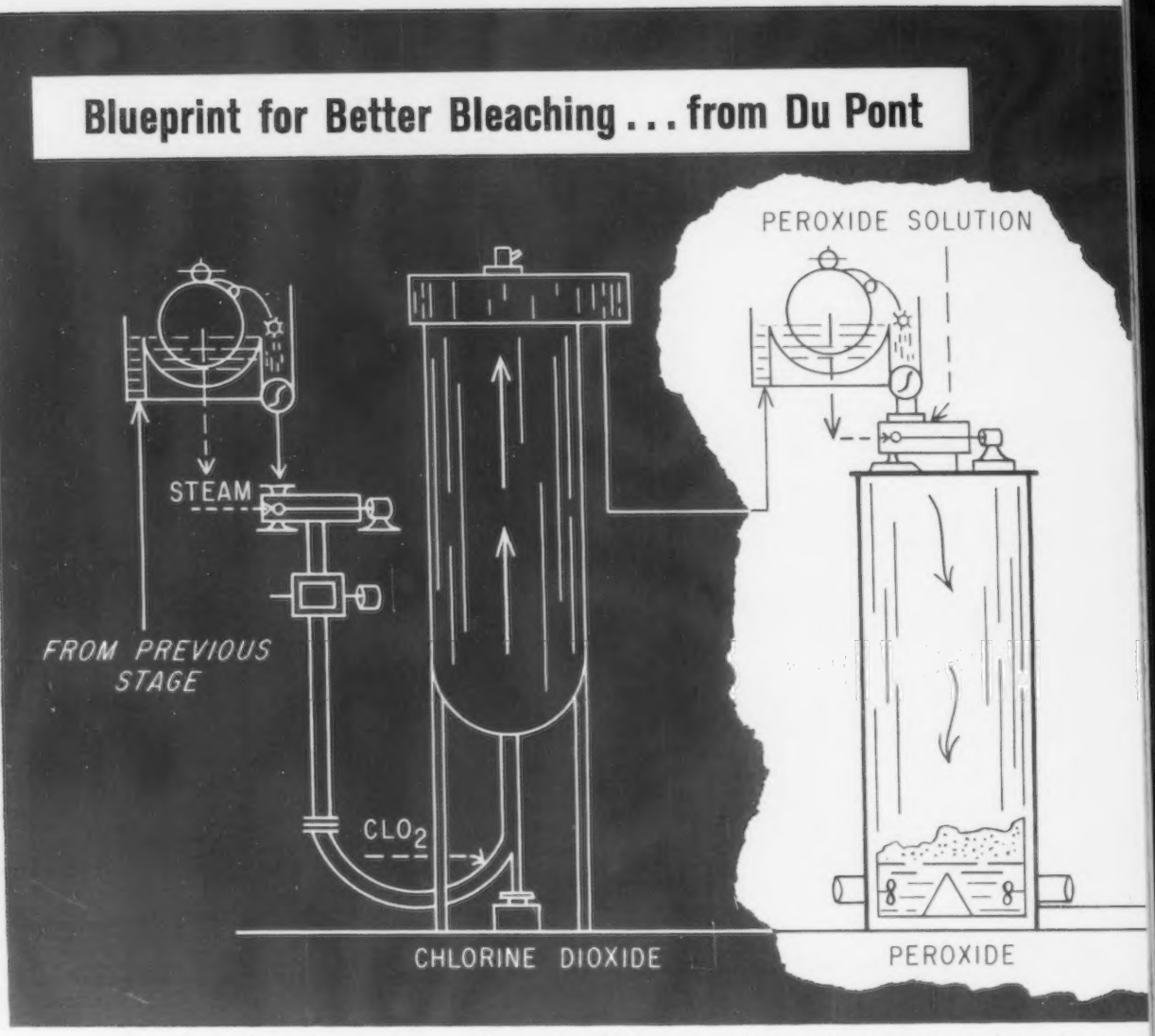
A comprehensive report on the application of UNITANE 0-120 is available through your Cyanamid Pigments representative. Contact him today or write

CYANAMID

AMERICAN CYANAMID COMPANY • PIGMENTS DIVISION • 30 Rockefeller Plaza, New York 20, N. Y.
Branch Offices and Warehouses in Principal Cities

Lighter ∧ WHITER AND BRIGHTER WITH UNITANE

## Blueprint for Better Bleaching . . . from Du Pont




Peroxide may be used as a replacement for caustic soda between two chlorine dioxide stages (as shown above)

# How you can use Du Pont Peroxides

With today's market trend demanding higher and higher brightness for kraft pulp, here are two ideas from Du Pont that might prove well worth your thorough investigation.

**1.** The use of hydrogen peroxide in the extraction step between the chlorine dioxide stages (as is shown above) can give you both premium brightness and outstanding color stability. For example, regular 88 to 89 brightness pulp can usually be easily increased to 92 when 0.2% peroxide is used in place of caustic soda.

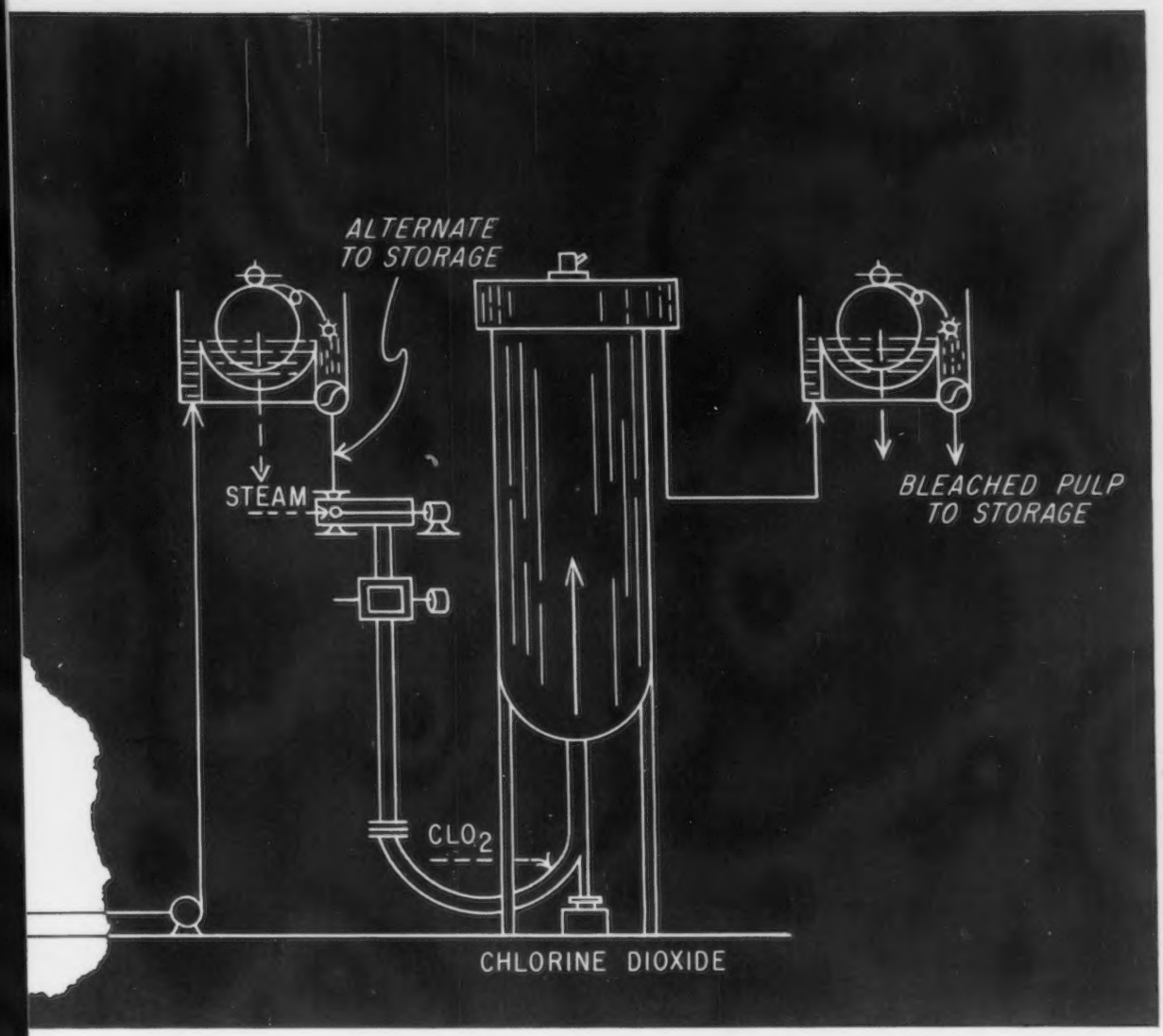
**2.** The use of hydrogen peroxide in the final stage following the chlorine dioxide treatment can result in brightness gains of 5-10 points

*CONTACT ONE OF THESE MEN FOR INFORMATION:*

**Midwest Area**
W. L. Liike, Chicago, Ill.—INdependence 3-7250

**New York & Boston Area**
C. R. Lombard, New York, N. Y.—LOngacre 3-6440

Or call: N. J. Stalter, Wilmington, Del.—PRospect 4-4698




or as a final treatment after a chlorine dioxide treatment, to give you higher pulp brightness.

# to increase kraft pulp brightness

for the peroxide-treated pulps, after standard heat reversion tests.

Du Pont peroxides are easy to use and require only a minimum of handling equipment to introduce into your operation. Du Pont technical representatives will be glad to show you what peroxides can do for you and can suggest process layouts (such as the one shown above) to fit into your present plant operation. Contact your nearest representative listed below, or write: Du Pont, Electrochemicals Department, Wilmington 98, Delaware.

**DU PONT PEROXIDES**

**ALBONE®** hydrogen peroxide

DU PONT REG. U.S. PAT. OFF.

**SOLOZONE®** sodium peroxide

BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

**West Coast Area**
P. E. Kiefer, Portland, Oregon—CApital 7-1281
**Southern Area**
R. W. Hammond, Charlotte, N. C.—FRanklin 5-5561

# PJT NEWS OF SUPPLIERS

W. A. Goodwin

R. E. Lehman

**Albany Felt Co.**, Albany, N. Y., has appointed William A. Goodwin sales engineer. He is servicing the company's paper mill customers in Virginia, North Carolina, and parts of Maryland, Tennessee and West Virginia. This territory formerly was covered by Frank J. McGrath, who is now general manager and treasurer of A. P. Wagenknecht Co., Inc., Thompsonville, Conn.

Before joining the Felt Sales Department, Mr. Goodwin was a sales engineer in the Albany firm's Industrial Fabrics Division. He makes his headquarters in Greenville, S. C.

**Glidden Co.'s** Chemicals Division has appointed Robert E. Lehman and J. Corson Smith national accounts representatives for its Pigments and Color department.

Both Mr. Lehman and Mr. Smith will report to James C. Rankin, national accounts manager for Glidden's Chemicals Division.

A graduate of Mercer University where he majored in physics and mathematics, Mr. Lehman also attended Western Michigan University's Coating School. He possesses a wide background in the paper industry.

Mr. Smith is a business administration graduate of Lehigh University and for the past 11 years has been in various sales and sales management positions working with the paint industry. His experience in the paint field includes technical service and he has a wide knowledge of raw materials and paint formulations.

Mr. Lehman and Mr. Smith will headquarter at the home office of Glidden's Chemicals Division in Baltimore, Md.

**W. S. Tyler Co.** of Cleveland, Ohio, producer of industrial woven wire cloth, and a major producer of vibrating screen machinery, has announced two personnel appointments in its expansion program. The appointments are Walter J. Parks as Director of product development—

W. J. Parks

E. E. Gardner

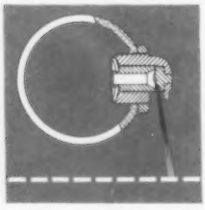
Screening Division and Edgar E. Gardner as chief engineer of the Screening Machinery Division.

Mr. Parks will assume the new post as director of product development after serving as chief engineer of the Screening Machinery Division for many years. In his new post he will devote full time to design improvement of existing products as well as the development of new products in the Screening field. He has been with Tyler over 25 years and is a graduate mechanical engineer.

Mr. Gardner, who succeeds Mr. Parks as chief engineer of the


*From Headbox to Reel* - **LODDING** *belongs*

Wire doctors

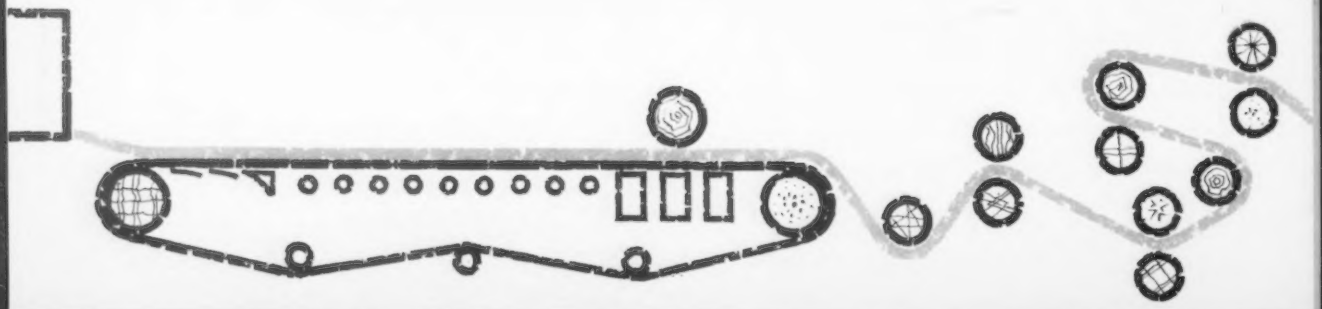


White water showers

Fresh water showers

Doctors

Fuzz removers



HEADBOX
Showers (White water and Fresh)
Oscillating or Stationary

FOURDRINIER
Breast roll doctors
Wire roll doctors
Stretch roll doctors
Guide roll doctors
Showers (White water and Fresh)
Wire doctors
Wire doctor boxes
Steam Showers

*Replacement blades for all doctors*

PRESS SECTIO
Press roll doctors
Felt showers

Screening Machinery Division, steps up from the post of assistant chief engineer of this division, which he has held for the past nine years. Prior to that he was with the Buell Engineering Co. of New York City. Mr. Gardner is an engineering graduate of Yale University.

**Manning, Maxwell & Moore, Inc.,** Stratford, Conn., has named several new sales executives with the formation of two new divisions from the former Consolidated Ashcroft Hancock Division.

New Valve Division sales executives include W. H. Bolin, general sales manager; R. F. Attner, marketing manager for "Hancock" valves; G. F. Bright, marketing manager for "Consolidated" valves; T. J. Naughton, product manager for "Hancock" valves; J. C. Rainey, mid-eastern (Pittsburgh) district manager; D. D. Clayton, southeastern (Atlanta) district manager; and A. J. Pfister, Pacigc Coast (Los Angeles) district manager.

For the Gauge & Instrument Division sales executives include F. J. Murphy, assistant general sales manager; M. S. Palmer, director of O.E.M. marketing; E. M. Dederer, assistant director of O.E.M. marketing; L. F. Kirby, product manager for "American" industrial instruments; and N. C. Rardon, mid-western (Chicago) district manager.

**Beloit Iron Works,** Beloit, Wis., has announced the appointment of Donald R. Simonds as vice president and general manager of integrated projects. This new division is aimed at offering complete equipment for paper mills in the United States and the world market. The Integrated Projects group will be

D. R. Simonds

J. D. Russo

working closely with consulting engineering firms, but the service offered by this group is not to be confused with services offered by consulting engineers.

**National Starch and Chemical Corp.** has named Joseph D. Russo supervisor of National Adhesive's Technical Development Laboratory at San Francisco. He will assume responsibility for the operation of the adhesive technical development and service functions of the West Coast division of the company.

Mr. Russo received his B.S. degree in chemistry from St. John's College in 1956, and upon graduation went to work at National's Alexander Laboratories in Plainfield, N. J. He was transferred to San Francisco in 1958.

**Allis-Chalmers Industries Group,** Milwaukee, Wis., has appointed William T. Havron as manager, industrial sales, New Orleans district. He succeeds Hugh C. Blair, who was recently named manager of the Phoenix district.

Mr. Havron has been a sales representative in Allis-Chalmers Birmingham, Miami, Atlanta and New Orleans districts. He joined Allis-Chalmers in 1951 after graduating from Alabama Polytechnic Institute.

**Crane Co.,** manufacturer of valves, plumbing, heating and air conditioning equipment, has announced the formation of a new Valve Servicing and Repair Division with plants and offices throughout the country to expedite the overhauling and reconditioning of industrial valves and speciality piping machinery.

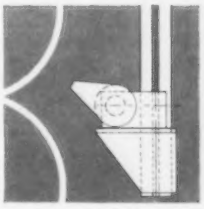
The first of the new division's nationwide network of valve repair facilities is now in operation in Chicago, with plants scheduled to open in Houston, Tex., during March and in Los Angeles, Calif., during April.

While the new facilities are pri-

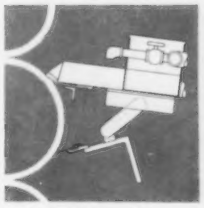

LODDING
*Engineering Corporation*
AUBURN, MASSACHUSETTS

Each of Lodding's family of related products is the result of specialized research, quality control, precision engineering, skilled craftsmanship. Each was designed to fill an essential assignment with the degree of efficiency that guarantees satisfactory mill performance.

If your needs fall within the specialized fields of doctoring or showering, let Lodding or a Lodding sales representative give you full assistance with any one or all of the members of this quality product family.

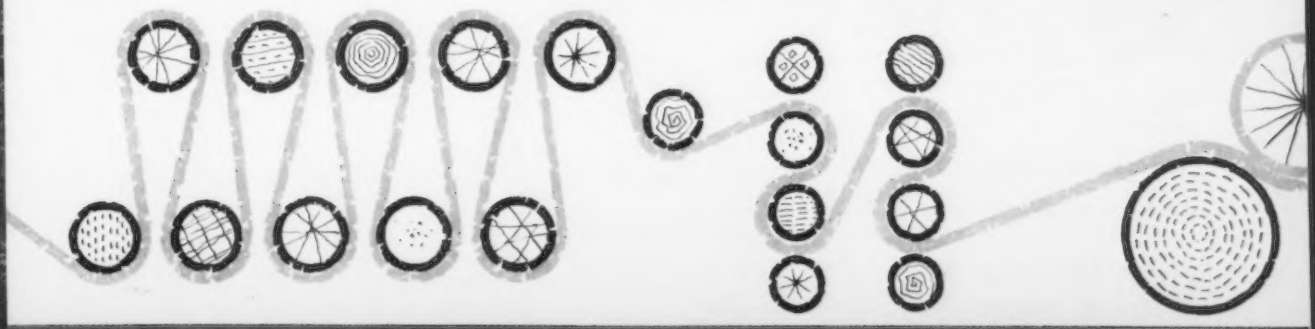


Steam showers



Water boxes

Caliper control doctors



DRYER SECTION
Dryer doctors
Fuzz removers
Oscillation (Hydraulic or Mechanical)

CALENDERS
Calender doctors
Caliper control doctors
Steam showers
Water boxes

REEL
Reel doctors

*Replacement blades for all doctors*

marily set up for the repair of Crane valves, other brand-name valves can be handled by Crane's experienced technicians. At present, repairs are limited to iron and steel valves, as follows: steel valves, series type, any make; iron valves, four inches and larger, any make; and Crane speciality valves and piping machinery.

**Dow Chemical Co.**, Midland, Mich. has appointed William F. Fisher as chemicals field salesman to serve the pulp and paper industry in northern Wisconsin.

Mr. Fisher will work out of Dow's Minneapolis office but will live in Appleton, Wis. He succeeds Theodore G. Moore, who recently was transferred to the chemicals merchandising staff at Dow's Midland headquarters.

Mr. Fisher has been a chemicals salesman in Dow's Houston, Texas, office for three years.

**Stanley Steel Strapping**, division of The Stanley Works, New Britain, Conn., has named Howard C. Robinson manager of the Middle Atlantic Region.

Mr. Robinson's headquarters are in Baltimore. The Middle Atlantic Region includes eastern Pennsylvania, southern New Jersey, Delaware, Maryland and Virginia.

He has had over 12 years of industrial experience, and represented Stanley Steel Strapping for more than five years in Maryland and Virginia.

**Dearborn Chemical Co.**, Chicago, announces that Frank Caskey, of Portland, Ore., who has been associated with the paper industry in the Pacific Northwest for 15 years, has joined the company as a sales representative for Oregon and Washington. Dearborn manufactures industrial water treatment chemicals including its recently patented Super-Filmeen which increases the speed of drying on paper mill rolls.

Mr. Caskey is a graduate chemist with degrees from Reed College at Portland and Oregon State University. He was, for six years, manager of technical sales in the paper field for Morden Machine Co. of Portland, Ore., and, previously for eight years, was senior research chemist for the Crown Zellerbach Paper Co. at its Camas, Wash., plant.


*"Paper conditioning the modern way"*

**BUILT TO OPERATE AT ANY MACHINE SPEED**

**SYSTEMS ALSO BUILT FOR APPLYING SIZING MATERIALS, STARCHES, WAX EMULSIONS, PLASTICIZERS AND OTHER SURFACE FINISHING SOLUTIONS.**

***BUILT FOR MANUFACTURING OR CONVERTING PROCESSES***

**WRITE FOR LITERATURE**

**VAPO SYSTEMS**

**132 W. Home Avenue, Villa Park, Illinois**


# Figures of the Week

**PAPER PRODUCTION RATIO REPORT**—American Paper & Pulp Assn. Figures

(Production as per cent of normal capacity)

COMPARATIVE WEEKLY SUMMARIES

| | | | | | |
|---|---|---|---|---|---|
| | Feb. 25 | Mar. 4 | Mar. 11 | Mar. 18 | Mar. 25 |
| 1961 | 88.0 | 90.8r | 92.0r | 91.2r | 90.7 |
| | Feb. 27 | Mar. 5 | Mar. 12 | Mar. 19 | Mar. 26 |
| 1960 | 96.5 | 97.1 | 97.6 | 98.7 | 99.0 |

r Revised.

COMPARATIVE MONTHLY SUMMARIES

| Year | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Year Avg. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1960 | 96.5 | 97.7 | 98.1 | 96.9 | 97.6 | 96.1 | 81.2 | 91.7 | 89.1 | 94.8 | 92.0 | 80.2 | 92.7 |
| 1961 | 87.9 | 90.0‡ | | | | | | | | | | | |

‡ Preliminary.

COMPARATIVE YEARLY SUMMARIES

| | 1954 | 1955 | 1956 | 1957 | 1958 | 1959 | 1960 | 1961 |
|---|---|---|---|---|---|---|---|---|
| Year to Date | 94.1 | 96.1 | 100.1 | 96.0 | 88.4 | 90.3 | 97.4 | 89.6 |
| Year Average | 91.6 | 96.2 | 97.9 | 90.4 | 87.0 | 92.2 | 92.8 | |

*All of the above data is based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available.*

**PAPERBOARD OPERATING RATIOS†**—National Paperboard Assn. Figures

COMPARATIVE WEEKLY SUMMARIES

| | | | | | |
|---|---|---|---|---|---|
| | Feb. 25 | Mar. 4 | Mar. 11 | Mar. 18 | Mar. 25 |
| 1961 | 89 | 89 | 93 | 91 | 91 |
| | Feb. 27 | Mar. 5 | Mar. 12 | Mar. 19 | Mar. 26 |
| 1960 | 91 | 94 | 94 | 94 | 93 |

COMPARATIVE MONTHLY SUMMARIES

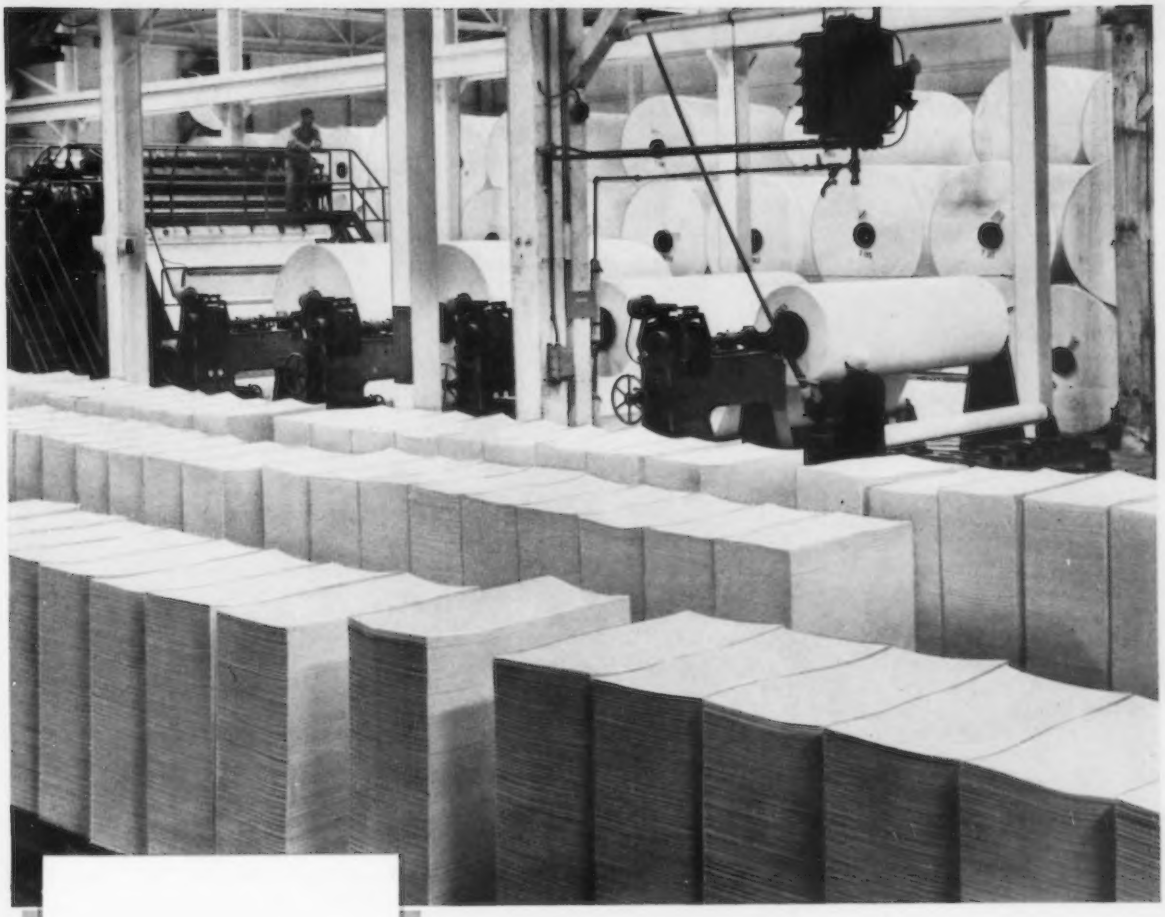
| Year | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Year Avg. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1960 | 92 | 95 | 94 | 93 | 94 | 92 | 78 | 94 | 88 | 93 | 86 | 73 | 89 |
| 1961 | 88 | 89 | | | | | | | | | | | |

‡ Preliminary.

† *Per cents of operation based on "inch-hours" reported on a 6-day basis to the National Paperboard Association.*

**SUMMARY OF PAPERBOARD STATISTICS**—National Paperboard Assn. Figures

| ITEM | WEEK ENDING March 18, 1961 | WEEK ENDING March 25, 1961 | CUMULATIVE TO DATE Jan. 1, 1961, to Mar. 25, 1961 |
|---|---|---|---|
| % Activity | 91% | 91% | 89% |
| Total | 320,783 | 313,642 | 3,597,443 |
| Containerboard—Domestic Use | 166,100 | 158,349 | 1,816,359 |
| Liner | 112,084 | 102,673 | 1,204,353 |
| Corrugating Material | 48,047 | 50,400 | 555,795 |
| Chip & Filler Board | 5,969 | 5,276 | 56,211 |
| Boxboard—Domestic Use | 99,725 | 97,737 | 1,134,900 |
| Folding | 58,459 | 60,866 | 674,367 |
| Set-Up | 9,814 | 9,292 | 110,221 |
| Special Food Board | 31,452 | 27,579 | 350,312 |
| Other Paperboard | 54,958 | 57,556 | 646,184 |
| Containerboard Type | 25,773 | 26,911 | 307,876 |
| Boxboard Type | 29,185 | 30,645 | 338,308 |
| Total Orders | | | |
| Received | 304,551 | 304,866 | |
| Unfilled End of Week | 434,750 | 426,654 | |



# THIS IS GEORGIANIER

# product

**Even though Rayonier produces the world's most complete line of pulps** and constantly strives to anticipate your market requirements, there's no complacency at Rayonier about product superiority.

**Instead we work to strengthen your competitive position** with pulps of increasing qualities of strength, opacity, brightness and formation. For we have a long-term commitment with the paper industry: to supply you with the truly great pulps at realistic prices—like Georgianier, another rewarding opportunity for the papermaker.

**For product excellence, start with excellence — a great Rayonier pulp!**

A bleached Kraft from southern pine, its high tear qualifies it admirably for quality paper products. Typical data on a Valley Test Beater at 30 minutes: Canadian Standard Freeness 530; Mullen Factor 116; Tear Factor 2.86; Fold Factor 12; Opacity 68.3%, G. E. Brightness 87.5%.

Write or telephone for your free samples and complete data.

RAYONIER
GREAT PAPER-MAKING PULPS

Rayonier Incorporated
161 East 42nd Street
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***World's Most Complete Line of Paper-Making Pulps:*** *Western hemlock bleached sulfites; western softwood bleached sulfates; western red cedar bleached sulfates; southern pine bleached sulfates; southern hardwood bleached sulfates; southern pine bleached sulfites.*

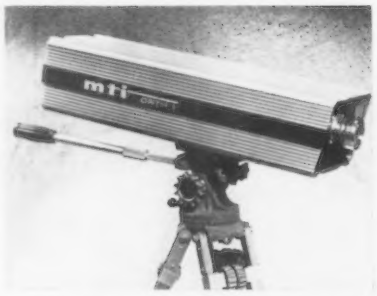
# NEW EQUIPMENT & SUPPLIES

### Low Light Levels No Problem For Closed Circuit TV Setup

The MTI Orth 1 closed circuit television system provides lightweight, portable equipment for a wide range of applications, including very low light level operation, says Maryland Telecommunications, Inc., 10 Winters Lane, Baltimore 28, Md.

Because of the special circuitry and a unique use of both transistors and vacuum tubes, says MTI, this system, even when operated with tube illumination down to .0001 foot candles, will provide usable pictures. For broadcast quality pictures, only 1 foot candle of light is required.

The complete system consists of the MTI Orth 1 Image Orthicon Camera, camera control and monitoring equipment. Because of its excellent resolution at low light levels, this system is suited for underwater work, nighttime viewing and dark area inspection, as well as inspection of automatic processes, quality control checks, education and training, meetings and conferences, data handling and other observation methods covering a broad category.

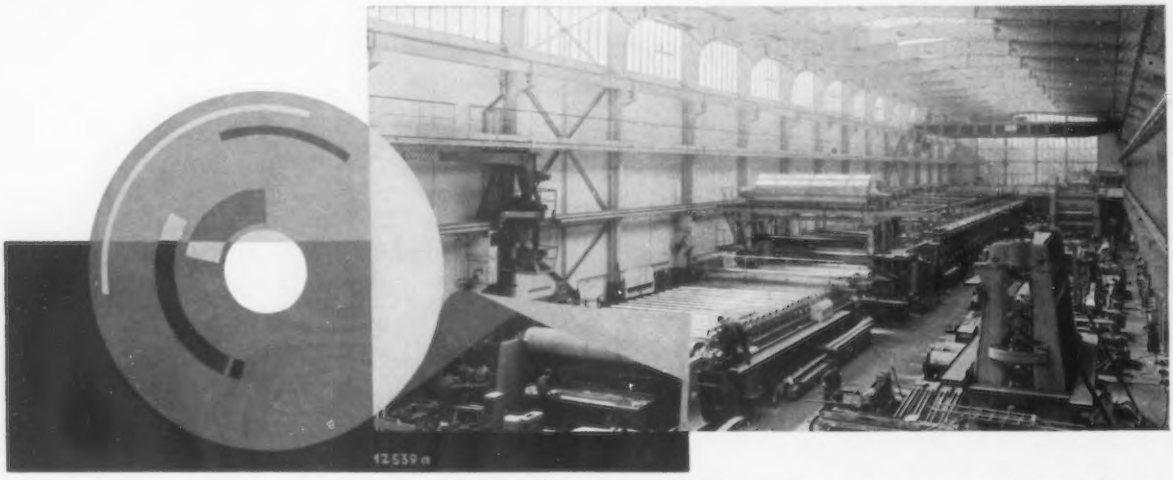



Some of the special features of this system pointed out by MTI are the extruded aluminum camera housing, simplified operation, completely modular construction, and a newly-designed Electronic Zoom which, by the pressing of a button, instantaneously enlarges the picture on the monitor screen.

### De-Inking Seen as Possible Use for Hydrolytic Enzyme

A process for the extraction and purification of certain hydrolytic enzymes may result in a substantial expansion of enzyme usage, according to a statement by Western Biochemical Corp. of San Francisco. The process allows volume production of amylase, protease and lipase enzymes having potency, purity and stability and effectiveness over a considerably wider range of pH and temperatures.

The catalytic activity of the enzymes is comparable to the magnitude of pure crystalline enzymes, which, combined with stability and purity, is expected to extend enzyme processing techniques into a variety of new areas. Among possibilities suggested by the manufacturers are the economical conversion of various fibers to quality grades of paper, recovery of cellulose from cotton lint-


Shop erection of a newsprint machine of 5,500 mm. (217 in.) wire width.

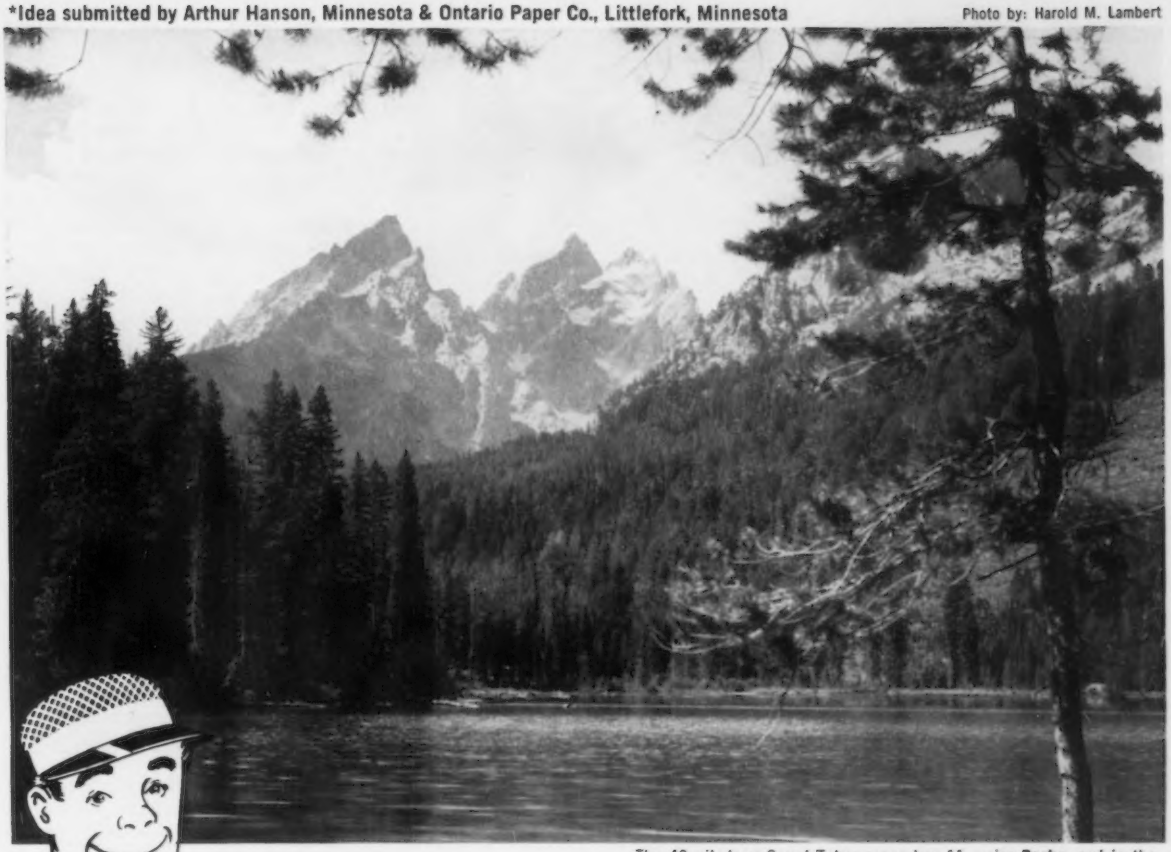
**SALEABLE PAPER**

within a minimum of time, sometimes even within a few hours after commencing operation, cannot be produced without a scrupulous shop erection of the paper machine. A shop erection is indispensable for fitting the many components – there are about 200 000 parts including standardized units for wide Fourdrinier machines – as well as for a speedy and smooth erection on mill site. Prior to delivery every paper machine is nearly completely erected in our shops by experienced personnel. The last fitting jobs are being done and after a thorough check the machine receives the first coat of paint.

**J. M. VOITH GMBH · HEIDENHEIM (BRENZ) · GERMANY**

*Idea submitted by Arthur Hanson, Minnesota & Ontario Paper Co., Littlefork, Minnesota

Photo by: Harold M. Lambert



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Ham Feltz, 612 First National Bank Bldg., Dept. J
Cincinnati 2, Ohio."

"Hamilton Felts can help *you* realize peak production, spectacular savings and increased profits, because they're 'water-conditioned' — especially designed, carefully woven and porosity proven — for faster water removal, so they'll deliver drier sheets to the driers, permit operators to run machines at higher speeds . . . longer . . . turning out more tonnage, with fewer stops and less broke or imperfections.

"Ask your Hamilton Felts Service Salesman about our 300 proven styles. If one of our 'standard 300' won't solve *your* needs, we will be happy to design a Hamilton Felt that will."

**SHULER & BENNINGHOFEN, HAMILTON, OHIO**

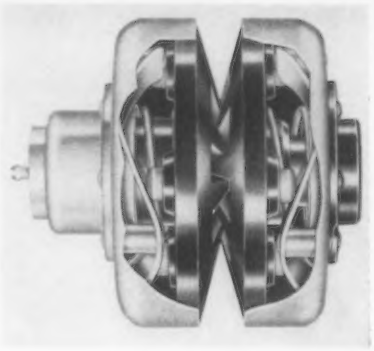
ers, the extraction of cellulose from wood wastes and the de-inking of waste papers. In the conversion of starch to dextrins, for paper sizings, the amylase enzyme is said to allow a substantially faster rate of dextrin production with only a barely detectable trace of sugar formation.

The enzymes—amylase, protease and lipase—are obtained by the culture of selected strains of *Bacillus subtilis*. The purification process, which is the subject of U.S. and Japanese patent applications, was developed over a period of 10 years by a Japanese biochemist. Exclusive manufacturing rights to the process are held by Pacific Laboratories, Inc., which has commenced limited production in a newly-constructed plant in Honolulu. Western Biochemical Corp., 755 Sansome St., San Francisco 11, is exclusive sales agent.

### Vari-Speed Pulleys Feature Spring-Loaded Cam Control

An exclusive cam control design to assure greater vari-speed efficiency is featured in a series of wide V-belt pulleys rated at 1 to 5 h.p. at 1750 r.p.m. They provide instantly variable ratios up to 3 to 1.

Each pulley face is independently

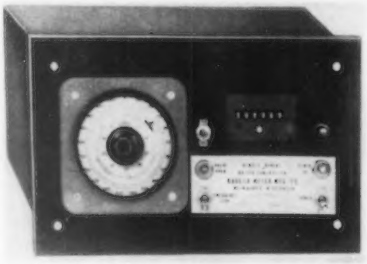


actuated by its own spring and cam assemblies. The opposite wedging action of each cam and cam follower prevents pulley spread. This is claimed to assure constant speed at all times, even under overload conditions. The cam action also automatically compensates for tension alignment to keep the belt constantly in proper alignment and never under more tension than required by the load. The springs are not driving members but serve only to keep pulley faces in contact with the belt for smooth and steady transmission of power.

Depending on the model, the pulleys use Nos. 087, 12 or 14 top width variable speed belts. Standard bore sizes are from 5/8 to 1 1/8 inches; bore lengths 2 1/2 to 3 5/8 inches, maximum pitch diameters 5.78 to 8.62 inches, minimum pitch diameters 1.875 to 2.87 inches, and motor travel 3 1/8 to 4 inches. Known as Models 1060, 1160, 1280, 1390 and 1590, the pulleys are manufactured by Hi-Lo Manufacturing Co., an affiliate of Lovejoy Flexible Coupling Co., 4949-H West Lake St., Chicago 44, Ill.

### Control Batching Operation From Remote Location

A remote control device for repeat batch metering of liquids is being introduced by Badger Meter Manu-



facturing Co., Industrial Products Division, Milwaukee, Wis.

Known as the Remote Repeat Batch Controller, it allows plant personnel to control automatically the measuring, mixing, blending, or batching of fluids from a convenient location far away from the meter itself. It is capable of handling repeat batches up to 1,000 gallons.

The remote controller is equipped with a reset totalizer, a counter to set the batch quantity desired, a push button start switch, and a stop switch for interrupting the batching operation.

The controller is pulsed by a momentary pulsing switch. When the batch quantity has been selected on the dial, the push button is pressed to open the control valve. After the pre-selected batch has been metered, the remote device closes the control valve, and the quantity dispensed is indicated on the totalizer.

The totalizer can be used to accumulate the gallonage figures for a series of batches, or it can be reset to zero after each batch. With the emergency switch, plant personnel can interrupt the batching operation at any time, and then complete the batch later. The controller is available for either horizontal or vertical flush mounting or for wall installation. Badger Meter Manufacturing Co., Industrial Products Division, 4545 West Brown Deer Road, Milwaukee, Wis.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- A tight seal in seconds.
- Pipe is held in perfect alignment.
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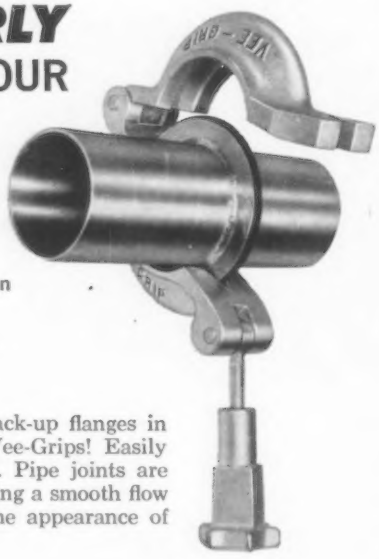

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Delivered Basis

| | U.S. | Canadian | Swedish | Finnish | Norwegian |
|---|---|---|---|---|---|
| Groundwood | $82.50/ 90.00 | $82.50/ 90.00 | $90.00/ — | $90.00/ — | $90.00/ — |
| Bleached Gw'd. | 97.50/100.00 | 97.50/100.00 | | | |
| Kraft, Blchd. | ‡140.00/150.00 | ‡140.00/150.00 | 150.00/ — | 150.00/ — | 150.00/ — |
| Kraft, Blchd. Hdwd. | 135.00/140.00 | | 140.00/ — | | |
| Kraft, Semi-bleached. | 130.00/140.00 | | | | |
| Kraft, Unbl. | 117.50/125.00 | 125.00/ — | 125.00/130.00 | 125.00/ — | |
| Sulphite, Blchd. | ‡135.00/140.00 | ‡135.00/140.00 | 140.00/ — | 140.00/ — | 140.00/ — |
| Sulphite, Bl. Hdwd. | 135.00/ — | | | | |
| Sulphite, Unblchd. | 125.00/ — | 125.00/ — | 125.00/ — | 125.00/ — | 125.00/ — |
| Sulphite, Unb'l. Gl'sn. | | 140.00/ — | 134.00/ — | | |
| Soda, Blchd. | 130.00/135.00 | 130.00/135.00 | | | |

‡ Depending on Brightness.

## COTTON LINTERS

F.O.B. OIL MILLS PER CWT
WEEK ENDED MARCH 28

| | Atlanta | Memphis | Dallas | Los Angeles |
|---|---|---|---|---|
| Grade 1 | n.a. | n.a. | n.a. | n.a. |
| 2 | n.a. | n.a. | n.a. | 8.00/7.50 |
| 3 | $7.25/6.75 | $7.50/7.25 | $7.50/7.00 | 7.25/6.75 |
| 4 | 6.75/6.00 | 6.50/6.25 | 6.50/6.25 | 6.50/6.25 |
| 5 | 6.00/5.50 | 5.75/5.50 | 6.00/5.50 | 5.75/5.50 |
| 6 | 5.50/4.50 | 5.00/4.75 | 5.25/5.00 | 4.50/4.25 |
| 7 | 4.50/4.00 | 4.25/4.00 | 4.75/4.00 | n.a. |

## WASTE PAPER MARKET

Mill Prices, f.o.b. Trucks Shipping Point — Includes Brokerage

These quotations are a partial indication of the price range on volume tonnage in each market on the date specified, as gathered from major dealers and brokers. SPECIAL PACKINGS AND SPOT TONNAGE NOT INCLUDED. Prices nominal.

| | New York | Boston | Chicago | Los Angeles |
|---|---|---|---|---|
| | April 3 | April 3 | April | April |
| No. 1 Mixed Paper | $ 7.00/ 9.00 | 4.00/ 7.00 | 6.00/ — | 12.00/ — |
| No. 1 News | 12.00/ 13.00 | 11.00/ — | 11.00/ — | 14.00/ — |
| Overissue News (Lg. size) | 11.00/ 13.00 | 9.00/ 11.00 | 16.00/ — | 18.00/ — |
| Mill Wrappers | 19.00/ 22.00 | 9.00/ 11.00 | 9.00/ — | 14.00/ — |
| Old Corrugated Containers | 17.00/ 18.00 | 16.00/ 17.00 | 18.00/ — | 16.00/ — |
| Super Resorted Kraft Paper | 35.00/ 40.00 | — / — | 28.00/ — | 45.00/ — |
| New Double Kr. Ld. Corr. Cuts | 27.50/ 30.00 | 30.00/ 32.50 | 30.00/ — | 27.50/ — |
| (Semi-chem. medium) | 45.00/ — | 45.00/ — | 42.50/ — | — / — |
| New 100% Kraft Corr. Cuts | 40.00/ 42.50 | — / — | 52.50/ — | — / — |
| New Br. Kraft, Env. Cuts | 65.00/ 70.00 | 65.00/ 70.00 | 47.50/ — | 45.00/ — |
| New Br. Kr. Bag Waste Prntd. | 50.00/ 55.00 | 50.00/ 60.00 | 47.50/ — | 35.00/ — |
| New Br. Kr. Bag Waste Unprintd. | 55.00/ 60.00 | 60.00/ 65.00 | 55.00/ — | 42.50/ — |
| No. 1 Groundwood Shvs. | 25.00/ 30.00 | 20.00/ 25.00 | 10.00/ — | 27.00/ 30.00 |
| White Newsblanks | 42.50/ 45.00 | 35.00/ 40.00 | 30.00/ — | 55.00/ — |
| No. 1 Soft White Shvs. | 55.00/ 60.00 | 55.00/ 60.00 | 50.00/ — | 75.00/ — |
| Super Soft White Shvs. | 65.00/ 75.00 | 70.00/ 80.00 | 60.00/ — | — / — |
| Hd. White Shvs. | 75.00/ 80.00 | 80.00/ 90.00 | 75.00/ — | 80.00/ — |
| Hd. White Env. Cuts | 90.00/ 95.00 | 100.00/105.00 | 80.00/ — | 103.00/ — |
| Col. Tab. Cards | 40.00/ 42.50 | 40.00/ 42.50 | 35.00/ — | 35.00/ — |
| Manila Tab. Cards | 57.50/ 60.00 | 55.00/ 60.00 | 55.00/ — | 60.00/ — |
| No. 1 Col. Ledger | 32.50/ 35.00 | 30.00/ 35.00 | 35.00/ — | 18.00/ — |
| White Ledger | 45.00/ 50.00 | 42.00/ 47.00 | 45.00/ — | 40.00/ — |
| Mixed Book & Mag.† | — / — | — / — | 8.00/ — | — / — |
| No. 1 Books‡ | 15.00/ 17.50 | 18.00/ 22.00 | 22.50/ — | 8.00/ — |

† Includes Time & Life; no coarse groundwood. ‡ Not to exceed 10% of groundwood.


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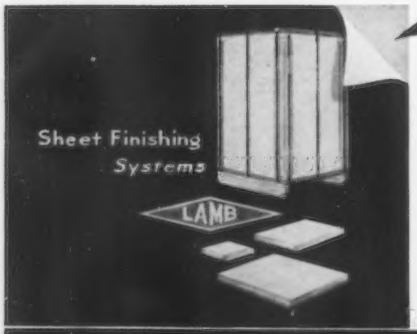


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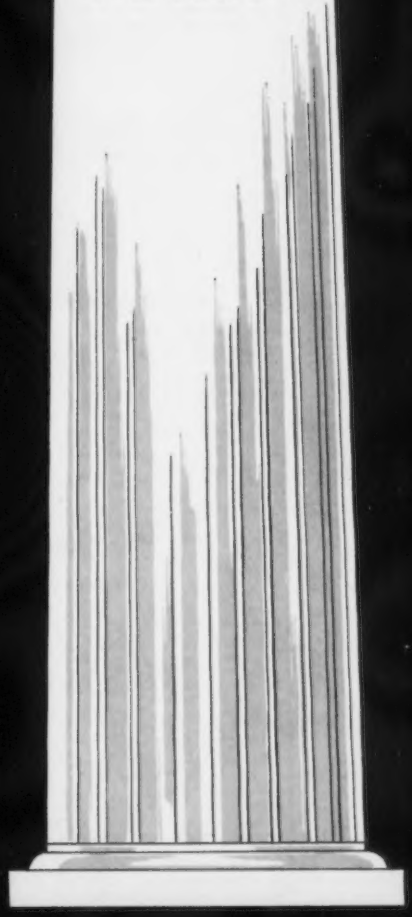

Our basic position enables us to control the purity of our chemicals from the raw material to the finished product we deliver.

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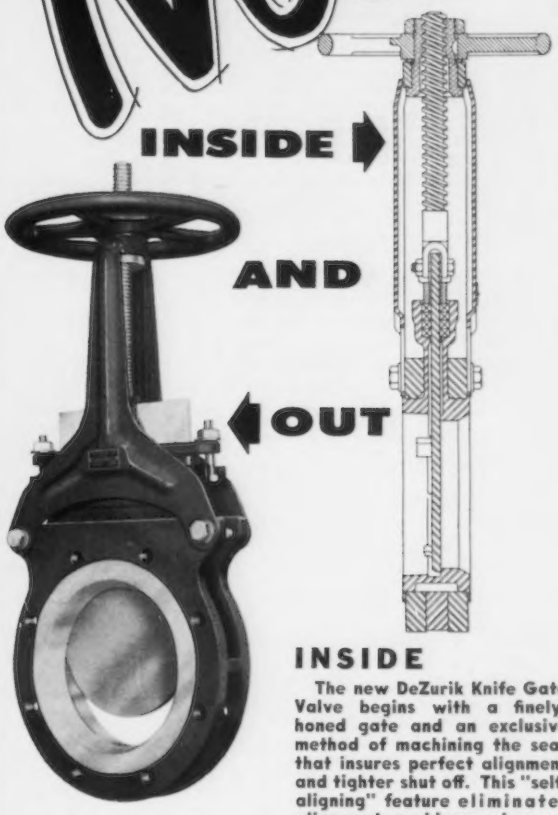
DeZURIK KNIFE GATE VALVES

# New

INSIDE

AND

OUT



## INSIDE

The new DeZurik Knife Gate Valve begins with a finely-honed gate and an exclusive method of machining the seat that insures perfect alignment and tighter shut off. This "self-aligning" feature eliminates alignment problems when re-packing the valve.

## AND OUT

The new design is topped-off with a neater, more streamlined superstructure that retains the strength of earlier DeZurik Valves.

In addition to these features, there are more advantages than you've ever had in one knife gate valve . . . advantages that make this DeZurik Valve the perfect stock valve for your mill!

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1—Hamblet sheeter, 90" face with Moore and White layboy and backstand. 4 top and bottom slitters, complete with Manco overlay and counter.
1—Clark Aiken 166" type H duplex sheeter for lengths from 25" to 84". Tape delivery to fixed layboy, complete with drives. New in 1956.
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1—Moore and White 4 drum winder 80" face.
1—Pusey and Jones two drum winder, 132" face.

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1—Bagley and Sewall Pope type automatic change reel, complete with water cooled brakes, anti-friction bearings, 47" dia., 110" face drum.
1—Black-Clawson uniform speed reel, 42" x 160" face drum, left hand with 4 mandrels, 4 Hannifin air cylinders, 2 Hannifin air controls, motor and starters in A-1 condition.
2—90" Bagley and Sewall 2 spool upright reels.
1—two spool 108" Pusey and Jones upright type reel.
1—two spool 76" Sandy Hill upright reel.

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1—Toledo continuous auto-check scales for 84" paper machine.
1—Toledo continuous auto-check scales for 65" paper machine.

The above Toledo scales will give a continual indication of the weight of a lineal unit of sheet material while in the process of manufacture.

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1—4 roll calender stack, 86" face, bottom roll 18" dia., 3 rolls 12" dia.
1—3 roll calender stack, 62" face, bottom roll 18" dia., 2 rolls 15" dia.
1—8 roll calender stack, 86" face, bottom roll 18" dia., 1—15" dia., 3 rolls 10" dia., 3 rolls 11" dia.

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5—Downingtown dryers, 36" dia., 72" face, A.S.N.E. stamped.
1—Yankee dryer (Beloit) 10 ft. dia. x 132" face.

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1—Nash Hytor vacuum pump, K-5, test no. L 11606 10" vacuum 570 rpm.
1—Nash Hytor vacuum pump H-7, test 6771, 24" vacuum 875 rpm.
1—Nash Hytor vacuum pump, size 0, 1200 rpm. 1½" intake, 1½" discharge, test no. 18330.

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25 rubber covered rolls, 173" face, 9" dia. (table).
4 rubber covered table rolls, 173" face, 7" dia.
2 rubber covered table rolls, 173" face, 11" dia.
3 rubber covered wire return rolls, 180" face, 11" dia.

**PRESS ROLLS**

1 rubber covered press roll, 105" face, 17½" dia.
1 rubber covered press roll, 99" face, 17½" dia.
1 rubber covered press roll, 108" face, 17½" dia.
1 rubber covered press roll, 109" face, 17¾" dia.
1 rubber covered press roll, 95" face, 22" dia.
1 rubber covered press roll, 126" face, 21" dia.
1 rubber covered press roll, 130" face, 19" dia.
1 rubber covered press roll, 123" face, 16¾" dia.

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A-10

## FOR SALE

### BEATERS
2—1500 lb. rag beaters, Valley Iron, bandless rolls, 54″ x 48″, cast iron tubs

### CALENDER STACKS
1—3 roll 84″ face
1—4 roll 72″ face (Extra heavy duty)
1—5 roll 86″ face

### CHIPPERS
1—96″ Murray 4 knife Chipper—anti-friction bearings
1—84″ 10 knife Carthage Chipper, Anti-friction bearings, with motor

### COATER
1—42″ Chapman Extrusion Type Coater

### CONSISTENCY REGULATOR
1—Poirier Stainless Steel, new condition

### CRUSHER & HAMMERMILL
1—Murray Chip Crusher
1—Williams Hammermill
1—Jeffrey Shredder

### CYLINDER MOLDS
5—36″ diameter x 75″ face, with couch rolls
1—36″ diameter x 82″ face
1—42″ diameter x 96″ face
2—42″ diameter x 106″ face
2—60″ diameter x 170″ face

### DRIVES
1—Jones 21 H.P., ratio 10 to 1 (enclosed angle drive)
1—#4 Reeves Drive
2—Falk Drives, 20 H.P. & 160 H.P.

### DRYERS
1—16″ diameter x 54″ face (steel)
1—28″ diameter x 84″ face
1—28″ diameter x 48″ face
2—Calender Dryers, bronze, 30″ x 128″ with frames, gears & necessary rolls to make up the unit.
1—36″ diameter x 44″ face
5—36″ diameter x 76″ face
23—36″ diameter x 84″ face
14—48″ diameter x 48″ face with bearings
2—48″ diameter x 52″ face with frames, gears, bearings
2—48″ x 60″ face frames, gears & bearings
1—48″ diameter x 108″ face.
6—48″ diameter x 130″ face
1—60″ diameter x 92″ face, anti-friction bearings
1—73″ diameter x 66″ face, with bearings

### EMBOSSING CALENDERS
1—43″ 3-roll Embossing Calender
1—48″ 2-roll Meadows Embossing Calender
1—51½″ 3-roll Smoothing Calender
1—57″ 3-roll Embossing Calender
1—62″ 2-roll Embosser
1—90″ 2-roll Smoothing Calender

### FILTERS
1—Oliver, 8 ft. x 12 ft., rubber lined, complete
1—Oliver Filter 8 ft. x 8 ft.
1—Dorr-Oliver Filter, 3 ft. dia. x 6 ft. face, stainless steel construction, with pump

### FLAT SCREENS
1—12 Plate "Packer"
4—14 Plate IMPCO, bronze vats

### JORDANS
2—#1 Jones High Speed Jordans, Stainless steel tackle, A.-F. Bearings, motors.
1—#1 Jones High Speed Jordan
1—Jones Standard, new spare tackle, with 75 h.p. motor
1—Noble & Wood Monarch, Type D, anti-friction bearings
1—Noble & Wood Mammoth Jr., with spare plug
1—Noble & Wood Baby Jordan, anti-friction bearings, with 20 h.p. motor
1—#6 Miami, anti-friction bearings

### KNIFE GRINDER
1—70″ Seybold

### LABORATORY EQUIPMENT
1—4″ face x 36″ diameter Saveall
1—Washer for 5 lb. Beater
1—24″ Saveall, stainless steel
1—20″ Fourdrinier Wet End & Press Section
1—Noble & Wood Cycle Beater with motor & stand
1—Williams Freeness Tester.
1—Cady Micrometer
7—Mullen Testers, motorized & hand operated
1—2 qt. Auto Clave, Stainless Steel
1—Elmendorf Tear Tester
1—27″ High Solid Coater
1—Noble & Wood Baby Jordan, anti-friction bearings, with 20 h.p. motor
2—Emerson, Jr., No. 1 Jordans, anti-friction bearings

### MISCELLANEOUS
1—Shartle Hydrafuge, 1000 g.p.m. (with motor)

### MOTORS
4—25 h.p. Westinghouse, totally enclosed, ball bearing, 705 r.p.m.

### PRESSAFINER
1—7″ Pressafiner, stainless steel construction, New 1955, with new spare motor

### PRESS ROLLS
2—Chilled iron, chrome plated 9″ x 72″
1—Chilled iron, chrome plated 10″ x 74″

### PULPERS
1—#1 Jones Pulp Master

### PUMPS
1—Economy Fan Pump 6000 g.p.m. 20′ head, 50 h.p. motor

### REELS
1—72″ Downingtown Reel, 2 bowl
1—84″ 3 bowl revolving reel
1—86″ 2 bowl reel
1—100″ Rice Barton 2 bowl reel, heavy duty
1—116″ Downingtown, 2 bowl, anti-friction bearings
1—123″ 3 bowl Revolving Reel
1—130″ Pope Reel (Rice Barton)
1—134″ 2 drum

### REFINERS
1—Rice Barton Dynofiner, details on request
1—12″ Wiener Refiner, with 200 h.p. motor
2—36″ Bauer double disc #185E Refiners, each with two 100 h.p. motors
1—#4 Dilts Hydrafiner, anti friction bearings

### ROLL HEADER
1—Valley Iron Roll Heading Machine, complete, for paper rolls 100″ long x 42″ diameter

### ROLLS
Felt, Table, Press, Breast, Couch, etc. Various sizes and types. (Bronze, Rubber, Iron, etc.)

### ROTARY SCREENS
4—#2A Bird Rotary Screens, copper vats
1—#2A—50 Bird, copper vat
2—APMEW Rotary Pulp Screens

### SAVEALLS
1—#6 Bird Saveall.
1—24″ Continuous Saveall, stainless steel
1—LaMort 48″ diameter x 82″ face cylinder mold
2—Savealls, cylinder molds, 42″ diameter x 106″ face, brand new vats
2—Savealls, Rice Barton, cast iron vats, cylinder molds 48″ diameter x 128″ face, complete with 18″ diameter couch rolls, all in very good condition

### SHEETERS
1—160″ Hamblet, simplex, complete
1—160″ Hamblet, duplex, complete

### SHREDDERS
1—16″ "Swift" Paper Shredder
2—Taylor Stiles Rag Cutters

### SLITTERS & WINDERS
1—26″ Cameron Type 26-2A, complete, constant tension & electric eye
4—42″ Cameron Type 6
1—42″ Cameron Type 9
1—42″ Cameron Type 26-2A
1—42″ Cameron Type 40-2
1—50″ Cameron Type 6
1—52″ Cameron Type 9.
1—86″ Two Drum Moore & White 50″ diameter rewind
1—96″ 4 drum Moore & White winder
1—64″ Waldron, Shear cut

### SLITTING DEVICE
84″ Quick change slitting device shear cut, complete

### SUCTION COUCH SHELL
1—Downingtown suction couch shell only. 127½″ face 26″ diameter

### SUCTION COUCH ROLL
1—Beloit 36″ diameter x 246″ face, SKF bearings

### SUCTION FELT ROLL
1—Gilbert & Nash 122″ face

### SUCTION PRESS ROLL
1—Sandusky 18″ dia. x 138″ face Suction Press Roll

### SUPER CALENDER STACK
1—9 Roll 56″

### TOILET WINDER
1—72″ Hudson-Sharp (Surface type winder)

### TRIMMERS
1—44″ Seybold Trimmer
1—95″ Seybold Trimmer, Model 15ZJ

### VACUUM PUMPS
2—#3 Nash Hytors
1—#4 Nash Hytor
1—#7 Nash Hytor, with 75 h.p. synchronous motor
1—H-7 Nash
2—K-5 Nash
2—L-4 Nash
3—L-5 Nash
1—L-6 Nash

### VATS
2—Brand new Downingtown Iron End Vats, for 42″ diameter x 112″ face cylinder molds. Will cut down to your size.

### VIBRATING SCREENS
1—Hummer Vibrating Screen, Stainless Steel
1—Selectro, 2 Stage, 5 ft. x 10 ft.

### WET MACHINES
1—84″ IMPCO Wet Machine

### YANKEE DRYERS
1—60″ diameter x 92″ face, anti-friction bearings
1—12 ft. diameter x 181½″ face


Paddy Ross, Pres.

# J. J. ROSS COMPANY

377 Frelinghuysen Ave. Tel.—Bigelow 3-3720 Newark 12, N. J.

## Help Wanted

### DIVISION
### ASSISTANT GENERAL MANAGER

New development in papermaking technology has created a new division of a prominent mill supplier now in growth processes building a multi-plant operation.

***Requirements:***

- **Proven capability in line management**
- **Previous assignments in or responsibility for Manufacturing, Research and Sales**
- **Graduate engineer**
- **Initiative, drive, and a personality that will inspire subordinates**
- **Established reputation in paper industry**
- **Age 35-45**

Rewarding compensation plans include incentive participation; location in desirable area providing outstanding family recreational and cultural advantages.

Write to Vice President & General Manager, Box 61-71, care Paper Trade Journal for completely confidential handling of your inquiry. Please mark envelope "Personal".

A-10

### PAPERBOARD DEVELOPMENT

Major division of multi-plant paperboard and carton manufacturer is searching for a competent young man to assume an important role in our division research and development lab. The work will involve quality control, development and application of standards, development of new products and new applications of old products, report writing, and customer complaints and inquiries on all grades of paperboard and test liner. Qualified applicant will have a major in chemistry or allied field and a minimum of two years experience in some or all of the above work in the paper industry or have a major with no experience required in pulp and paper from an accredited school. We are prepared to pay the going rate—plus—for a well qualified applicant. Western Illinois location, City of 40,000. Our employees know of this advertisement. Reply in confidence giving complete details of education, experience, and personal data in first letter or resume including salary requirements to R. Effler, P.O. Box 1033, Hutchinson, Kansas.

A-24

WANTED—Paper mill desires experienced tour boss with background in specialties and saturating papers. If interested send complete background details and recent photograph to Box 61-55, care Paper Trade Journal.

A-10

## Situations Wanted

GRADUATE INSTRUMENT ENGINEER with ten years sales, application and startup experience, desires position, central engineering department, pulp and paper industry. Prefer Eastern U. S. Address Box 61-70 care Paper Trade Journal. A-17

## Situations Wanted

**"BOARD MILL MANAGER,** 37, currently employed, ambitious, aggressive, tremendously successful in the application of basic cost reduction techniques. 12 years experience as Technical Director, Superintendent, Divisional Manager, following 5 years of Product Research and Devel. Will consider top-flight opportunity only." Address Box 61-67 care Paper Trade Journal. A-24

**Use the Classified Ads For Best Results.**

## Situations Wanted

**STOCK PREPARATION AND COLORMAN**

Life long experience in some of the finest mills on the continent, including considerable time in dye manufacturing laboratory. Drawing top salary — also social security. Seeking challenging assignment. Require 30 day notice. Address Box 61-62 care Paper Trade Journal.

A-10

**SUPERINTENDENT**

Technical graduate, twenty-six and one-half years experience in technical work and operations. Desires change with opportunity to move into higher management responsibilities. Employed at present. Address Box 61-60 care Paper Trade Journal.

A-10

**ENGINEER-SENIOR PROJECT**

History of successful machines. Group leader, experienced in design, supervision of building, de-bugging of paper, foil, polyethylene, bag, laminating and printing machinery, wishes to join aggressive company. Address Box 61-64 care Paper Trade Journal.

A-10

***Production executive*** **— conversion of boards, paper & film. Well versed in heading up all production functions in an organization; or reorganization deal. Multiple manufacturing units. Employed — wishes change for challenging opportunity. Box No. 61-9 care Paper Trade Journal.**

A-24

## For Sale

### FOR SALE
### LOW PRICES

2—86" B. & S. Wet Machines; Bronze and Rubber Press Rolls; A.F. Bearings on Couches and Cylinder Molds. Complete with Gear Drives. Excellent Condition.

**RUDERMAN MACHINERY EXCHANGE**
Gouverneur, New York
Phone 333-334

TF

# FOR SALE

Section of 32 Rice Barton dryers 60" diameter x 157½" with double deck frames, gears, bearings, top and bottom felt equipment, four 48" felt dryers. Dryer section last operated at speed of 860 FPM. Insured for 35 lbs. steam pressure.

To go with this dryer section we can furnish either a Fourdrinier or Cylinder Wet End, also equipment which could be used to make up a paper machine.

**Frank H. Davis Company, Inc., P.O. Box 231, Cambridge 39, Mass.**

M-1

## Help Wanted

# WANTED MILL MANAGER

### WITH STRONG FINE PAPER BACKGROUND FOR WELL ESTABLISHED, AMERICAN OWNED OPERATION IN SOUTH AMERICA

**To $20,000 Start—One Month Annual Vacation**

Our client, a famous American papermaking family with extensive interests in South America, has decided to change the product mix of its most successful mill to include a much higher percentage of fine grades. To accomplish this objective to the optimum degree, a broadly experienced fine papermaker will be brought from the States to take over full direction of the manufacturing and converting facilities as Mill Manager. No responsibility for sales or finance. Command of Spanish or Portuguese not necessary. Office and operating personnel bilingual.

Subject mill is located in the suburbs of one of South America's finest, ultra-modern, large cities, world renowned for its graciousness and charm. Ideal climate, living conditions, schools, medical, recreational, cultural. Ten minutes from Atlantic Ocean. Country absolutely stable politically—a democracy for over 100 years.

Make initial written inquiry in duplicate to Mr. George M. Sunday personally, enclosing two pictures of self and wife and two copies of comprehensive resume covering vital statistics; education; social, religious and professional affiliations; and detailed chronological treatment of business background and experience, including present and past earnings, including present and past earnings. Full confidence assured.

Telephone conference will follow, at which time cogent details will be revealed and arrangements made for initial personal interview in New York with client principals.

## SUNDAY, INC.

A-10

*Personnel Consultants*

*Pulp, Paper, Packaging and Allied Industries*

6 East Monroe Street Chicago 3, Illinois ANdover 3-1970

## Help Wanted

## For Sale

### FOR SALE
**Paper converting Plant Equipment**

Cutters, Slitters, Rewinders, Sheeters Laminators, Rewinders, Machine Shop, Paper Rolls, Wax Glue, Plugs.

**Appointment MO 7-8316 Mid 3-7751**

A-10

FOR SALE:—Two Ply Roll Laminator 50" wide Combination 8 Roller Parry Liner with Moore & White Sheeter, for Papers, Boards from Rolls to finished sheets. GREGGORY, INC., 203 N. Wabash, Chicago, Ill. A-10

## Wanted

WANTED — Small Paper Mill to purchase or lease. Address Box 61-69 care Paper Trade Journal. A-10

## Sales Representation

**COMPLETE REPRESENTATION**

With my considerable experience, I am now prepared to set up a warehouse—form a selling organization and distribute in the Metropolitan Area, proven paper products that are unfinished, semi finished or finished.

Will do this on an outright sales basis—consignment, bonded warehouse or on a commission basis. Address Box 61-59 care Paper Trade Journal. A-10

**Keep your eye on our Classified Advertising Section**

# FOR SALE

2 Cylinder Approximately 90" Trim Paper Machine

**Vats:** 48"x102" mould with rubber couch. 60"x102" mould, 18" diameter rubber couch a.f.

**Fans:** 4 Claridge size 11 fans, motor driven.

**Suction Drum Roll:** 18"x102" Millspaugh with L 8 Nash pump.

**Suction Primary Press:** 22" Downingtown driven primary suction press roll 105" drill face. Top roll rubber covered, r.c. 19¾", a.f. bearings.

**First Press:** Top roll 19⅝" R.C. Bottom roll 19⅝" with felt equipment.

**Second Press:** Reverse suction press. Bottom roll 24"x105" Beloit R.C. with L 6 Nash pump. Top Roll 22", brass, a.f. Also equipment as last used.

**Dryer Section:** 16 - 42" diameter x 102" B. & C. d.d. frame, bottom felt, new 1941. 45 Beloit dryers 42" x96" d.d. frame, gears, bearings, bottom felt.

**Calenders:** Two 7 roll Beloit box frame calenders.

**Reel:** Three spool Beloit revolving type.

**Winder:** Langston 108" CA. New 1942. Rewinds 60" roll.

**Drives:** 8 Shartle spiral drive units. New 1941 with multiple disc clutch and cone pulley. Lineshaft belted to 225 HP Terry steam turbine.

**Screens:** 2 Jonsson screens with motors.

**Beaters:** 7 Dayton 1500 lb. 48"x48" beaters with washers, c.i. tubs. 2—65"x60" Dayton high speed tub beaters, c.i. tubs. Bandless type.

**Stock Pumps:** 10x20 Beloit duplex motor driven. 10x20 Beloit triple motor driven. 7x16 Shartles, single plungers.

**Digesters:** 14 Globe rotary digesters.

**Vacuum Pumps:** Two L 6 Nash. One L 8 Nash.

**Scales:** Toledo Print-O-Weight Scale, Model 64. 30 ton truck sale. Fairbanks Morse 5000 lb. platform scale 5'x6'.

**Miscellaneous items:** File cabinets, metal chairs, air conditioner, straw conveyors, steam engines, boilers. 2 Dillon Jordans.

Equipment to be sold as a unit or in parts—Inspection can be made on the premises at Vincennes, Indiana.

## FRANK H. DAVIS COMPANY, INC., P. O. Box 231

Cambridge 39, Mass. Telephone TR 6-0365-6-7

M-1

# ADVERTISERS


Acme Steel Company ..... —
Air Reduction Chem. Co. ..... —
Air Reduction Sales Co. ..... —
Albany Felt Co. ..... 18C
Alginates Industries, Ltd. ..... 51
Allied Chem. Corp., National Aniline Div. ..... —
Allied Chem. Corp., Solray Process Div. ..... 25
Allimond, Ateliers de Construction ..... —
Allis Chalmers Mfg. Co. ..... —
American Bitumuls & Asphalt Co. ..... —
American Bridge Div., U. S. Steel Corp. ..... —
American Cyanamid Co.
Paper Chemical Div. ..... 13
Dyes Dept. ..... —
Organic Chem. Div. ..... —
Pigment Div. ..... 61
American Defibrator Co. ..... —
American S. F. Products ..... 56
American Steel & Wire Co. ..... —
American Viscose Corp. ..... —
Ames Company Inc. ..... —
Anglo American Clays Corp. .. 72
Anglo-Canadian Pulp & Paper Mills ..... —
Anglo Paper Products Ltd. .. 45
Anheuser-Busch, Inc. ..... 56
Antara Chemicals, Sales Div. Gen. Aniline & Film Corp. . —
Apnew, Inc. ..... —
Appleton Machine Co. ..... —
Appleton Wire Works ..... —
Armco Drainage & Metal Prod. Co. ..... —
Armco Steel Corp. ..... —
Arnold Hoffman & Co. ..... —
Asten-Hill Mfg. Co. ..... —
Atlantic Coast Line R. R. .... —
Babcock & Wilcox Co. ..... —
Bahr Brothers Mfg. Co. ..... —
Bailey Meter Co. ..... —
Bauer Bros. Co. ..... —
Becco Chem. Div. Food Machy. Corp. ..... 7
Beloit-Eastern Corp. ..... —
Beloit Iron Works Co. ...18A & 18B
B. I. F. Industries ..... —
Bird Machine Co. ..... 31
Bixby, R. W. Inc. ..... —
Black-Clawson Co. ..... —
Black-Clawson Int., Ltd. ..... —
Bolton & Sons ..... —
Brandon Sales, Inc. ..... —
Broughton, A. E. & Co. ..... —
Brown Company ..... —
Bruderhaus (Maschinenfabrik Zum) ..... —
Buckeye Cellulose Corp. ..... —
Buffalo Forge Co. ..... —
Buffalo Pumps ..... —
Butterworth, H. W. & Sons Co. —
Cady, E. J. & Co. ..... —
Cadillac Associates Inc. ..... —
Cameron Machine Co. ..... 3
Carthage Machine Co. ..... —
Celgar Ltd. ..... —
Celleco, A. B. ..... —
Cellulose Development Corp. .... —
Central Soya Co. ..... —
Cesalpina S.P.A. ..... —
Chemico ..... —
Ciba Company ..... —
Clark-Aiken Company ..... —
Classified Advertising ..... 74
Cleveland Crane & Engrg. .... —
Columbia-Geneva Steel Div., U. S. Steel Corp. ..... —
Combustion Engrg. Co. ..... —
Corn Products Sales Co. .....34A
Crane Company ..... —
Curtiss-Wright Corp. ..... —
Davis, Frank H., Co. Inc. ..76 & 77
Dewey & Almy Chem. Div. W. R. Grace Co. ..... ..22 & 23
DeZurik Corporation ..... 73
Diamond Alkali Co. ..... —
Dixon Chem. & Res. Co. .... —
Dobeckmun Company ..... —
Dodge Mfg. Co. ..... 20
Dorries, O., A. G. ..... —
Dorr-Oliver ..... —
Dow Chemical Co. ..... —
Dow Corning Corp. ..... —
Draper Bros. Co. ..... —
Dryden Paper Co., Ltd. .....34D
du Pont, E. I. de Nemours & Co., Dyes & Chem. Dept. .... —
Electrochemical Dept. ...62 & 63
Pigments Dept. ..... —
Duverre Inc. ..... —
Eaton Manufacturing Co. .... —
Ebasco Services, Inc. ..... —
Economy Equipment Co. ..... —
Egan, Frank W., & Co. ..... —
Egger, Emile & Co. ..... —
Electric Mchy. Mfg. Co. ..... —
Elixman Paper Core Co. ..... —
Escher Wyss G.m.b.H. ..... —
Evans, W. P. & Son, Ltd. ..... 10
Export Supplement Bet. 50 & 51
Fabri Valve Co. of America .. —
Farrel-Birmingham Co. ..... —
Fibre Making Processes Inc. .. —
Finckh, Herman ..... —
Fitchburg Screen Plate Co. ... —
Food Mchy. & Chem. Sales Dept., Chemicals & Plastics Div. ..... —
Food Mchy. & Chem. Corp. Chlor-Alkali Div. ..... —
Foxboro Co. ..... —
Freeport Sulphur Co. ..... —
Garlock, Inc. ..... 12
Gaspesia Sulphite Co. Ltd. ... —
Gates Rubber Co. ..... —
Geigy Chemicals Corp., Geigy Dyestuffs Co. ..... —
General Dyestuffs Co. ..... —
General Tire & Rubber Co. ... —
Gibbs-Brower Co. ..... —
Gilbert & Nash Co. ..... —
Glidden Company ..... —
Goodyear Tire and Rubber Co. .....Cover 2
Gottesman-Central National Org. —
Goulds Pumps ..... 17
Great Eastern Packing & Paper Co. ..... —
Great Lakes Carbon Corp., Dicalite Dept. ..... —
Green, Inc., Frank B. ..... —
Greening & Sons, Ltd. ..... —
Grinnell Co., The ..... —
Gurley, W. & L. E. ..... —
Hamblet Machine Co. ..... —
Harbison Walker Refactories .. —
Hardinge Company, Inc. ..... —
Harland Eng. Ltd. ..... —
Harris-Seybold ..... —
Hayssen Mfg. Company ..... —
Heimbach, Thomas J. ..... —
Hercules Powder Co. ..... —
Hooker Chemical Co. ..... —
Huber, J. M. Corp. ..... —
Hudson Sharp Machine Co. .. —
Hungerford & Terry, Inc. .... —
Hunt, Rodney ..... —
Hunt & Moscrop ..... —
Huyck Felt Company .....33 & 34C
Hyster Company ..... —
Improved Machinery, Inc. .... —
Ingersoll-Rand Co. ..... —
Inglis, John, Co. ..... —
Industriplanering ..... —
Jagenberg U.S.A., Inc. ..... —
Jagenberg Werke ..... —
Jamesbury Corp. ..... 59
Jenkins Brothers ..... —
Johns-Manville Corp. ..... —
Johnson, Alvin H., Co. ..... 71
Johnson Corp., The ..... —
Jola, G.m.b.H. ..... —
Jones, E. D., Corp. ..... —
Kalamazoo Tank & Silo Co. ... —
Kamyr, Inc. ..... —
Karlstads Mekaniska Werkstad . —
Kellogg, M. W. Company ..... —
Kenyon, James & Son ..... —
Kidder Press Co. ..... —
Knox Woolen Co. ..... —
Kamyr, Inc. ..... —
Koppers Co., Inc. ..... —
Krauss-Maffei-Imperial G.m.b.h. 57
Lamb-Grays Harbor Co. ..... 72
Lamort Fils ..... —
Langston, Samuel Co. Back Cover
La Papeterie ..... —
Laporte Titanium Ltd. ..... —
Leje & Thurne, A. B. ..... —
Lestoil, Inc. ..... —
L'Homargy ..... —
Link-Belt Co. ..... —
Lob, Albert Maschinen und Apparatebau ..... —
Lodding Engineering Co. ..64 & 65
Lukon, Inc. ..... —
Lunkenheimer Co. ..... 72
Lyddon & Co. ..... —
Main, Charles T., Inc. ..... 71
Manchester Machine Co. ..... —
Marathon—A Division of American Can ..... —
McLean, Ltd. ..... 51
Mead Pulp Sales, Inc. ..... —
Mecke, Klaus, & Co. ..... —
Metron Instrument Co. ..... —
Miehle-Goss-Dexter ..... —
Miller Corp., Harry ..... —
Millspaugh, Ltd. ..... —
Mine and Smelter Supply Co. .. —
Minerals & Chem. Philipp Corp. ..... —
Minneapolis-Honeywell ..... 14
Mixing Equipment Co. ..... —
Monsanto Chemical Co. ..... 16
Montmorency Paper Co., Inc. —
Moore & White ..... —
Morden Machine Co. ..... 11
Mt. Vernon Mills, Inc. ..... —
Multi-Amp Electronic Corp. .... —
Multi Metal Wire Cloth Co. .... —
Murray, D. J., Mfg. Co. ..... 64
Nalco Chemical Co. ..... 55
Nash Engineering Co. ..... 35
National Aniline Div., Allied Chem. Corp. ..... —
National Starch & Chemical Corp. ..... 19
National Tube Div., U. S. Steel Inc. ..... 8
Newport News Shipbldg. & Dry Dock Co. ..... —
New Jersey Zinc Co. ..... —
Nichols Eng. & Research Corp. ..... —
Nopco Chemical Co. ..... —
Norton Co. ..... 33
Oakie Products Inc. ..... —
Olin Mathieson ..... —
Osborne Paper Mill Equip. Co. . 74
Overly's Inc. ..... 70
Paper Conv. Mch. Co. ..... —
Parsons & Whittemore ..... 54
Patton Mfg. Co. .....Front Cover
Penick & Ford ..... —
Penn. Ind. Chem. Corp. ..... —
Penobscot Chemical Fibre Co. .. —
Pennsalt Chem. Corp. ..... —
Perkins Goodwin Co. ..... —
Pfaudler Permutit Inc., Permutit Div. ..... —
Pioneer Paper Stock Co. .... —
Potdevin Machine Co. ..... —
Powell Valves ..... —
Price & Pierce, Ltd. ..... —
Puget Sound Pulp & Timber ... —
Rauma Repolaoy ..... —
Raymond, Charles P., Service —
Rayonier, Inc. ..... 67
RCA Industrial Electron Prod. —
Record Fdy. & Mich. Co. .... —
Red Ray Mfg. Co. ..... —
Rhoads, J. E., & Sons. ..... 15
Rice Barton Corp. ..... 28
Riedel, Gus & Son ..... —
Riegel Paper Corp. .....Cover 3
Robbins Instrument Co. ..... —
Rockwood Sprinkler Co. ..... —
Rohm & Haas Co. ..... —
Ronningen-Petter Co. ..... —
Roosevelt Paper Co. ..... —
Rosenblads Patenter, R. B. ..... —
Ross, J. J. Co. ..... 75
Ross, J. O., Engrg. Co. ..... —
Ross Midwest Fulton Corp. .. —
Ross Paper Machinery Co. ... —
Ruderman Machinery Service .. 76
Rust Engineering Co. ..... 71
Sandoz Chem. Wks. ..... —
Sandy Hill Iron & Brass Wks. —
Scapa Dryers Inc. ..... —
Seaboard Air Line R. R. Co. 34B
Shawinigan Resins Corp. ..... 9
Sheffield Corp. ..... —
Shuler & Benninghofen ..... 69
Signode Steel Strapping Co. ..... —
Sinclair Company ..... —
Sirrine, J. E., Co. ..... —
SKF Industries ..... —
Smidth, F. L., & Co. ..... —
Smith & Winchester Mfg. Co. .. —
Sonoco Products Co. ..... —
Southworth Machine Co. ..... —
Spraying Systems Co. ..... —
Sprout Waldron & Co. ..... —
Stadler Hurter & Co. ..... 71
Staley Mfg. Company ..... —
Starch Products, Ltd. ..... —
Stebbins Engrg. Co. ..... —
Stein, Hall & Co. ..... —
Steinen, Wm., Mfg. Co. ..... —
Stevens, Inc., Charles R. .... —
Stone & Webster Eng. Corp. .. —
Stowe-Woodward, Inc. ..... —
St. Regis Paper Co., Kraft Div. ..... —
St. Regis Paper Co., Panelyte Div. ..... —
Sturge Ltd., John & E. ..... —
Sulzer Brothers ..... —
Sunday, George M., Assoc. 74 & 77
Taylor Instrument Co.'s ..... —
Taylor-Wharton Company .... —
Tennessee Corp. ..... 73
Texaco, Inc. ..... 24
Texas Gulf Sulphur ..... 21
Thermal Equip. Corp. ..... —
Thiele Kaolin Co. ..... —
Thiry & Company ..... —
Thomas Paper Stock Co. ..... 72
Thompson, John, Co. ..... —
Titanium Pigment Corp. ..... —
Torrington Co. .....18D
Tyer Rubber Company ..... 58
United Engrg. & Fdy. Co. .... —
Universal Metal Hose Co. .... —
U. S. Industrial Chem. Co. Div. of National Distillers & Chem. Corp. .....26 & 27
U. S. Steel Corp. ..... 8
United States Steel Export .. —
United States Steel Supply Co. —
Valley Iron Works ..... 6
Vanderbilt, R. T., Co. ..... —
Vapo Systems Co. ..... 66
Virginia Smelting Co. ..... —
Voith, J. M., G.m.b.H. ..... 68
Waldron-Hartig Div., Midland Ross Corp. ..... —
Wallingford Steel Co. ..... —
Walworth Co. ..... —
Wartsila Koncernen A. B. ..... —
West End Chemical Div., Stauffer Chem. Co. ..... 18
West Va. Pulp & Paper Co. .... —
Weyerhaeuser Co. ..... —
Williams-Gray Co. ..... —
Wisconsin Wire Works ..... —
Woodpulp, Inc. ..... —
Wyandotte Chem. Corp. ..... —


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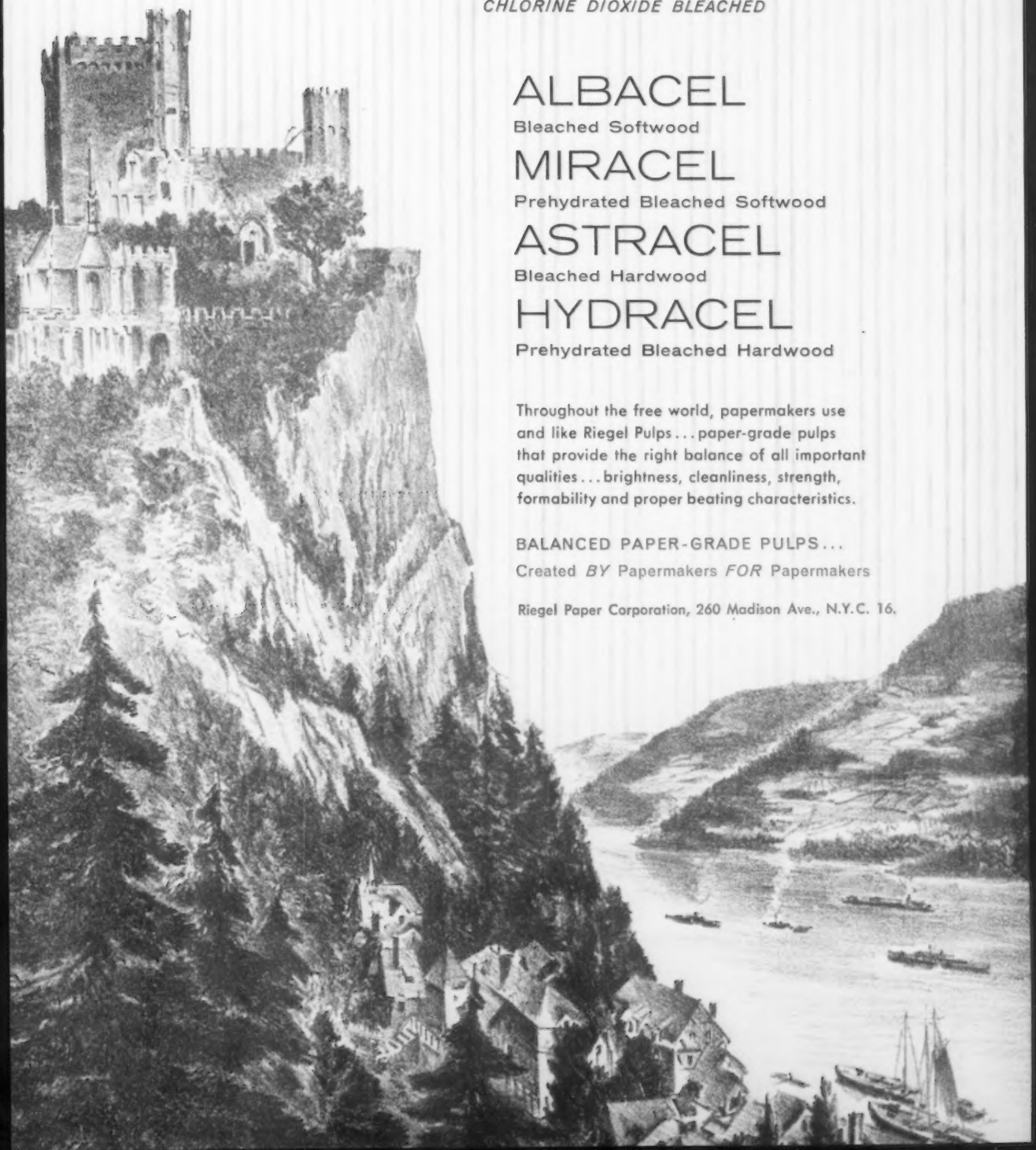

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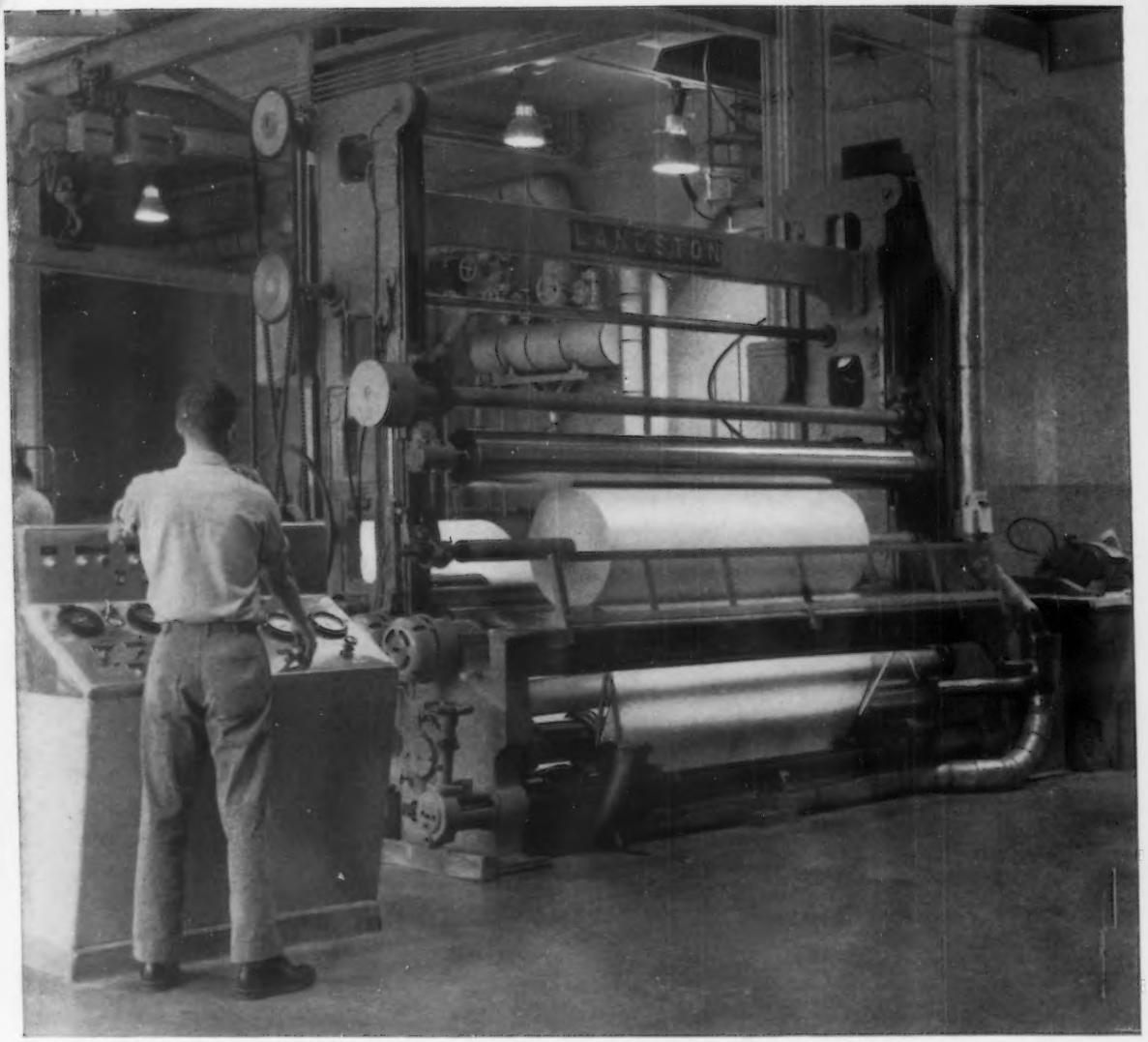


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